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THE MEMPHIS DEPOT
TENNESSEE

ADMINISTRATIVE RECORD
COVER SHEET

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FINAL

Former Defense Distribution Depot Memphis, Tennessee

Engineering Evaluation/Cost Analysis (EE/CA)

Old Paint Shop and Maintenance Area

Parcels 35 and 28

August 1999

Prepared for

U.S. Army Engineering and Support Center,
Huntsville

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Prepared by

CH2M HILL

Foreword

This Engineering Evaluation/Cost Analysis (EE/CA) evaluates alternatives and selects a recommended alternative for removing chemical contamination from a former paint shop and maintenance area (Parcels 35 and 28) at the southwestern corner of former Defense Distribution Depot Memphis, Tennessee (Memphis Depot or Depot), so that the area can be turned over to the Depot Redevelopment Corporation as part of Base Realignment and Closure (BRAC) activities at the Depot.

This EE/CA is a focused feasibility study containing only the amount of information, alternatives development, and evaluation necessary to define the most suitable remedial action for Parcels 35 and 28. It has been developed and organized in general accordance with U.S. Environmental Protection Agency (EPA) 540-R-93-057, *Guidance on Conducting Non-Time-Critical Removal Actions Under CERCLA*, August 1993.

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Abbreviations and Acronyms

ACM	asbestos-containing material
ARAR	applicable or relevant or appropriate requirement
BCT	BRAC Cleanup Team
bls	below land surface
BRAC	Base Realignment and Closure
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
DRMO	Defense Reutilization and Marketing Office
EE/CA	Engineering Evaluation/Cost Analysis
EPA	U.S. Environmental Protection Agency
HI	Hazard Index
MCACES Gold	Micro-Computer Aided Cost Estimating Software – Gold Software Copyright
MCL	maximum contaminant level
msl	mean sea level
µg/L	micrograms per liter
mg/kg	milligrams per kilogram
OSHA	Occupational Safety and Health Administration
OU	operable unit
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
POTW	publicly owned treatment works
PPE	personal protective equipment
QC	quality control
RBC	risk-based criteria
RCRA	Resource Conservation and Recovery Act
RI	remedial investigation
RI/FS	remedial investigation/feasibility study
TAL	target analyte list
TCLP	toxicity characteristics leaching procedure
TDEC	Tennessee Department of Environment and Conservation
TSCA	Toxic Substances Control Act
UST	underground storage tank
VOC	volatile organic compound

Executive Summary

This Engineering Evaluation/Cost Analysis (EE/CA) evaluates alternatives and selects a recommended alternative for removing chemical contamination from a former paint shop and maintenance area at the southwestern corner of the former Defense Distribution Depot Memphis, Tennessee (Memphis Depot or Depot), so that the area can be turned over to the Depot Redevelopment Corporation as part of Base Realignment and Closure (BRAC) activities at the Depot.

The Memphis Depot is a former Defense Department supply depot located in a mixed residential, commercial, and industrial area in central Memphis approximately 1 mile northwest of the Memphis International Airport. (See Figure 1-1 that shows the location of the Depot within Memphis.) The depot received, warehoused, and distributed supplies to all U.S. military services and some civil agencies located primarily in the southeastern United States, Puerto Rico, and Panama. The facility operated from its construction during World War II until its closure in 1997.

The Depot Redevelopment Corporation has expressed interest in acquiring the former paint shop and maintenance area, referred to as Parcels 35 and 28, under BRAC. (See Figure 1-5 that shows Parcels 35 and 28 with the location of associated facilities, surfacing, and security fence.) Memphis Depot personnel indicate that the Depot Redevelopment Corporation currently plans to develop the area for industrial purposes. Parcels 35 and 28 consist of the following facilities:

- Building 1084 – A former maintenance shop, which was also used over time as a wood shop and pesticide storage area;
- Building 1085 – A concrete slab from a former grease rack;
- Building 1086 – An industrial building formerly used as a preparation area, paint shop, and storage area;
- Building 1087 – An industrial building formerly used as a large-vehicle paint shop;

- Building 1088 – An industrial building with a former sandblast facility;
- Building 1089 – A partially enclosed warehouse where some sandblasting occurred; and
- Buildings 1090 and 1091 – Small Quonset huts formerly used to store paint and other supplies for paint shop operations.

These facilities are located within the fenced industrial area of the Memphis Depot. With the exception of some concrete driveways in the vicinity of Buildings 1086, 1087, and 1088, most of the surface area in Parcels 35 and 28 are gravel. Outside the facility fence is a grassed utility corridor bounded by city streets. (See Figure 1-10 for sampling locations.)

Surface soil samples indicate that surface soil (zero to 12 inches in depth) within the fenced industrial part of Parcels 35 and 28 contains a variety of contaminants associated with the former functions of the area. The detected concentrations were distributed throughout the parcels and were not concentrated in any particular area. In general, the most frequently detected constituents were metals, polycyclic aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs), phthalates, and pesticides.

Concentrations of PAHs and lead were detected in samples along Perry Road, within the grassed utility corridor outside the perimeter fence. The locations of the detected PAHs and lead suggest that they may be associated with traffic along Perry Road, and not the industrial operations within the industrial area. PAHs and lead are common constituents of exhaust gases from motor vehicles and are often found in significant concentrations along public roads. It is possible, however, that the elevated concentrations of PAHs and lead along the road may still be associated with industrial activities at the Depot because concentrations of these constituents from near-road samples adjacent to paint spraying and sandblasting operations are elevated relative to other samples near the road, but farther away from these operations. Additional sampling is needed with the utility corridor to determine the source of the elevated concentrations of PAHs and lead.

Surface soil concentrations of detected constituents were evaluated relative to the industrial and residential screening criteria based on background concentrations, BRAC Cleanup Team (BCT) screening values, and the most recent (October 1998) EPA Region III risk-based criteria (RBC) corresponding to a Hazard Index (HI) of 1.0. Areas with surface soil sample results exceeding these industrial and residential criteria were identified. (See Figure 1-12 and 1-13 that show the sampling locations that exceeded the screening criteria.)

On the basis of these evaluations, and consideration of land use and accessibility, the following actions were deemed appropriate in Parcels 35 and 28:

- Removal of contaminated surface soil with the fenced industrial area to the industrial screening criteria discussed in Subsection 1.4.1 of this report. (See Figure 1-14 for estimated limits of excavation.)
- Additional surface soil sampling at locations between the perimeter fence and Perry Road to determine if elevated concentrations of PAHs and lead are the result of paint spraying and sandblasting activities within the industrial portion of Parcels 35 and 28.
- No further action in the utility corridor if it is confirmed that elevated concentrations of PAHs and lead along Perry Road are not related to past activities within the industrial part of Parcels 35 and 28.
- Removal of surface soil within utility corridor to the residential screening criteria if it is confirmed that elevated concentrations of PAHs and lead are related to past industrial activities within the industrial part of Parcels 35 and 28.

All of the industrial buildings within the fenced industrial area contain dust and residues from their past use. Although no sampling has been done in these areas, it is anticipated that constituents will be similar to those detected in the adjacent graveled areas. Since these buildings are within a secured area with a proposed industrial use in the future, it is proposed that removals of contaminants within the buildings be done in accordance with industrial screening criteria.

Two special areas of potential contamination were also noted during the study. These include:

- Unsampled backfill from an underground storage tank removal at Building 1085 in 1989. The tank formerly contained waste oil, but also reportedly had been the possible receptor of various liquids containing petroleum hydrocarbons, pesticides, polychlorinated biphenyls, and metals.

- A former gravel-filled drainage sump beneath the slab at Building 1084, which drained a former maintenance pit area. This sump is covered by the concrete slab.

It is proposed that these areas be sampled and that contaminated soil, if any, be removed using the industrial screening criteria discussed in Subsection 1.4.1 of this report.

Three removal scenarios were developed on the basis of the removal criteria discussed above. These included:

- Alternative 1 – Decontaminate Existing Metal and Masonry Buildings and Associated Equipment for In-Place BRAC Transfer; Remove and Dispose of Wooden Structures, Contaminated Soil, and Debris;
- Alternative 2 – Decontaminate Existing Metal and Masonry Buildings for In-Place BRAC Transfer; Decontaminate, Remove, and Dispose of Associated Equipment; and Remove and Dispose of Wooden Structures, Contaminated Soil, and Debris; and
- Alternative 3 – Decontaminate, Remove, and Dispose of All Above-Grade Buildings and Associated Equipment and Remove and Dispose of Contaminated Soil and Debris.

Alternatives were evaluated in terms of effectiveness, implementability, cost, and the following removal action goals and objectives:

- Reduce the potential risk to long-term site users to a level deemed acceptable to U.S. Environmental Protection Agency (EPA) and Tennessee Department of Environment and Conservation (TDEC);
- Be technically appropriate and feasible to accomplish using commonly accepted construction practices;
- Minimize, to the extent possible, the volumes of materials that must be removed and landfilled offsite;
- Have a reasonable and acceptable cost;
- Be implemented in an expedited manner to meet BRAC parcel transfer and leasing schedules; and
- Involve minimal post-removal operational, maintenance, or monitoring requirements.

Table 4-1 summarizes the results of the evaluation process. All removal action alternatives can be implemented and all can meet the stated removal action goals. There is a potential for slightly greater effectiveness with Alternatives 2 and 3, but this potential requires progressively increased work scope, disposal requirements, and cost. Final selection, therefore, is essentially a function of intended use requirements of the facilities and cost.

On the basis of these evaluations, the following recommendations were made:

- Alternative 2 is recommended as the primary alternative for remediating Parcels 35 and 28. This alternative provides, at a reasonable cost, open and fully decontaminated buildings that could be used for a variety of purposes. By removing the sandblast and paint equipment, the potential for recontaminating the area by similar future operations is minimized.
- Alternative 1 should be considered if the proposed future use is similar to the past use and requires the equipment to remain in place. If Alternative 1 is selected, it is recommended that the future tenant be required to accept any future risk and costs associated with inaccessible contamination that might be located during any future equipment removals and/or any contamination associated with this future use of the area.
- Alternative 3 is not recommended. Added benefits of removing the buildings do not appear to justify the high cost of such work.

1.0 Site Characterization

1.1 Description and Background

1.1.1 Site Location

The former Defense Distribution Depot Memphis, Tennessee (Memphis Depot or Depot) covers 642 acres of land in Memphis, Shelby County, Tennessee. Approximately 5 miles east of the Mississippi River and just northeast of the Interstate 240-Interstate 55 junction, the Depot is in the central section of Memphis approximately 4 miles from the central business district and 1 mile northwest of Memphis International Airport. Airways Boulevard borders the Depot on the east and provides primary access to the installation. Dunn Road, Ball Road, and Perry Road serve as northern, southern, and western boundaries, respectively, of the Main Installation. Figures 1-1 and 1-2 show the location of the Memphis Depot within Memphis. Figure 1-3 shows the boundaries of the Depot in relation to surrounding roads and the location of operable units within the facility.

1.1.2 Type of Facility and Operational Status

The Memphis Depot is a former Defense Department supply depot that received, warehoused, and distributed supplies common to all U.S. military services and some civil agencies located primarily in the southeastern United States, Puerto Rico, and Panama. The facility was constructed during World War II and was operated from that time until its closure in 1997.

Parcels 35 and 28 are located at the southwestern corner of Operable Unit 2 (OU-2), an industrial area of the Depot where maintenance and repair activities were undertaken. Figure 1-4 shows the configuration of OU-2, including the location of Parcels 35 and 28 and the location of suspected sites of potential contamination based on past use. Figure 1-5 shows a larger view of Parcels 35 and 28 with the location of associated facilities, surfacing, and perimeter fence.

Approximately 7.5 acres of the 12-acre area contained in Parcels 35 and 28 are located within the perimeter fence surrounding the Main Installation. This area is industrial where maintenance and repair activities were undertaken. Except for the grassed area as its southern end, this part of Parcels 35 and 28 consists of industrial building, concrete and asphalt pavements, and gravel surfacing.

The part of Parcel 35 within the Main Installation perimeter fence was primarily used as a maintenance area. Specific facilities in this parcel included:

- Building 1084 (Early Removal Site 87) – This building is a former maintenance shop, which was also used over time as a wood shop and a pesticide storage area. It consists of wood-frame structure with metal and fiberglass siding on a 40-foot by 30-foot concrete slab. Its total height is about 20 feet. Drawings indicate that the building had a 3-foot-deep pit area, which drained to the subsurface by a pipe and gravel sump. The pit area has since been filled in or covered with concrete. The building has a grated inlet, which drains to the facility stormwater drainage system by a 300-foot tile drain.

- Building 1085 (Early Removal Sites 29 and 88) – This building is the former location of a covered grease rack. All that remains of the structure is a 37-foot by 12-foot concrete slab and a concrete retaining wall. A 1,000-gallon underground storage tank (UST), which was used for collection and storage of waste oil, was removed in 1989. A second UST, which was part of the former hydraulic lift system in the building, was closed in-place in 1989 by filling it with sand. It contained hydraulic fluid and is reported to have had a capacity of 100 gallons.

- Building 1086 (No Further Action Site 30) – This building was used as a preparation area, paint shop, and storage area. The southern end is a 120-foot by 40-foot fully enclosed masonry and metal-sided building with a paint booth, racks, and other equipment associated with its former use. The northern end is a 120-foot by 40-foot partially enclosed storage area with metal siding and roof. The entire structure is constructed over a 240-foot by 40-foot concrete slab. The total height of the building is about 29 feet.

- Building 1087 – This building is the former paint shop. It consists of a metal-sided building with concrete stem walls constructed on a 144-foot by 35-foot concrete slab. Within the building are two large paint booths and ventilation systems associated with the painting operations. The total height of the building is about 30 feet.

- Building 1088 – This building is the former sandblast facility. It consists of a 62-foot by 21-foot steel sandblast chamber and a 20-foot by 40-foot enclosed equipment room with pumps, tanks, and other equipment associated with sandblasting operations, and a covered staging area. The total height of the building is about 20 feet.
- Buildings 1090 and 1091 – These buildings are small Quonset huts that were used as storage areas for paint and other supplies for paint shop operations. Each Quonset hut is located on a 40-foot by 20-foot concrete slab to store paint for painting operations. Each Quonset hut is about 10 feet high.

The portion of Parcel 28 within the industrial area was used primarily as a storage area. However, some maintenance activities may have occurred in that area.

The primary facility on Parcel 28 is Building 1089 (Remedial Investigation Site 89), a partially enclosed storage building used for material storage and a small-object sandblasting operation (two northern bays only). The building consists of a 660-foot by 60-foot concrete slab covered by a metal frame building with a sheet metal roof and sheet metal siding on the two ends and one side. The total height of the building is about 25 feet.

With the exception of some concrete driveways in the vicinity of Buildings 1086, 1087, and 1088, most of the surface area within the industrial parts of Parcels 35 and 28 is gravel. Parts of the gravel surface in the vicinity of Buildings 1087 and 1088 included Remedial Investigation Site 32 and Screening Sites 31 and 33 due to the presence of dust and sandblast debris in the gravel from sandblast and paint operations.

The remaining 4.5 acres of Parcels 35 and 28 are located outside the perimeter fence. This area is a grassed utility corridor, which provides a buffer zone between the Main Installation perimeter fence and Perry Road.

The Depot is currently under the ownership and control of the Department of Defense, Defense Logistics Agency. Parcels 35 and 25 will be transferred to the ownership of the Depot Redevelopment Corporation for reuse as an industrial area.

1.1.3 Structures and Topography

About 60 percent of the Main Installation is developed land. Most of the Main Installation's land area has been graded, paved, and built up. Some of the few remaining unpaved areas were used for open storage of various materials and equipment. The only significant grassed and treed area is the golf course, located in OU-3.

The topography in the Main Installation is generally level. Surface elevations range from approximately 316 feet above mean sea level (msl) in the Defense Reutilization and Marketing Office (DRMO) storage yard next to Dunn Avenue to 267 feet above msl in the low area below Lake Danielson's earthen dam. The location of the DRMO Yard and Lake Danielson are shown in Figure 1-3. The topography across OU-2 is essentially level, with a geographic high in the southwestern corner. Contours on Figure 1-4 show the topography of OU-2.

1.1.4 Geology and Soil Information

1.1.4.1 Regional Geology

The area of Memphis, Tennessee, straddles two major subdivisions of the Atlantic Coastal Plain Physiographic Province. Figure 1-6 shows a general geologic cross section of the Memphis area. The Memphis Depot is situated within a major structural feature termed the Mississippi Embayment. This area is described as a youthful to mature belted coastal plain (ref. 1).

Information describing major regional geologic units has been obtained from Wells (ref. 2), Moore (ref. 3), Nyman (ref. 4), and Graham and Parks (ref. 1). The Quaternary and Tertiary strata in the Memphis area are composed of loosely consolidated deposit of marine, fluvial, fluvioglacial, and deltaic sediments. In Tennessee, unconsolidated sediments (Cretaceous through Quaternary) reach their maximum thickness at Memphis, where they range from 2,700 to 3,000 feet.

1.1.4.2 Geology at the Memphis Depot

The geology at the Memphis Depot was investigated by reviewing the existing published geologic information (ref. 5 and ref. 6) and work performed during 1990 Remedial Investigation (RI) activities by Law Environmental (ref. 7). CH2M HILL conducted additional groundwater well installations in March 1996 and again in October 1998. On the basis of the soil borings and monitoring wells installed during the 1990 RI, cross sections were developed that illustrate the postulated occurrence, attitude, and relationships of the geologic units encountered. The cross sections are generalizations, and local variations in subsurface conditions should be expected. The strata encountered during 1990 RI activities (ref. 7) included loess, fluvial deposits, Jackson Formation/Upper Claiborne Group clays (based on interpretation by Law Engineering), and what has been interpreted to be the Memphis Sand Formation. Figure 1-7 illustrates a geologic cross section of the Depot that includes the area in this EE/CA. Monitoring wells installed in this area did not extend into the Memphis Sand Formation.

The uppermost geologic unit at or near ground surface in the area included in this EE/CA is loess (eolian deposits consisting of brown silty clay, clayey silt, and fine sandy clayey silt). Loess was encountered at all drilling locations. Its maximum thickness is reported to be about 65 feet; it thins considerably toward the east. This unit is described as a brown to yellowish low-plasticity silt or low-plasticity clay. Locally, it may contain thin, discontinuous, fine sandy layers enclosed within silts and silty clays.

Fluvial (terrace) deposits of Quaternary and possibly Pliocene age underlie the loess and were encountered at all drilling locations during the 1990 RI activities by Law Environmental (ref. 7). The unit is composed of three generalized members that can be traced through the area included in this EE/CA:

- Silty clay, silty sandy clay, or clayey sand (upper layer);
- Poorly graded (less than 5 percent silt or clay), fine- to medium-grained sand, and
- Gravelly sand.

Beneath the silty clay/sandy clay/clayey sand are layers of sand and sandy gravel. These layers may alternate. The sand layers range from poorly graded to well graded, fine- to coarse-grained, very well sorted to poorly sorted quartz grains. The lower sand layers are poorly graded and are tan to white. The sand layers show a coarsening downwards into a gravelly sand, with chert being the primary gravel constituent. These fluvial deposits range from zero to 100 feet in thickness. The thickness is highly variable because of erosional surfaces at both top and base. Locally, in the Memphis area, the fluvial deposits may be absent (ref. 1).

The Late Ecocene Jackson Formation and upper part of the Claiborne Group lie beneath the fluvial (terrace) deposits. The upper Claiborne consists of the Jackson, Cockfield, and the Cook Mountain Formations. Because of lithologic similarities, the Jackson Formation and the Cockfield Formation cannot be reliably subdivided in the subsurface of the Memphis area. The Jackson/Cockfield Formations consist of sand, silt, clay, and lignite beds. The preserved sequence is predominantly Cockfield. The Cockfield Formation is typically composed of clay and silt in the upper part and sand in the lower part, although locally this may be reversed (ref. 6). Lignite beds, up to 10 feet in thickness, occur in the clays, silts, and sands. The base of the Cockfield Formation is faulted, and dips to the west at a rate of 10 to 40 feet per mile.

The thickness of the Jackson Formation is reported to range from zero to 150 feet (ref. 5 and ref. 6). Where the Jackson Formation is present, the Cockfield may be from 235 to 270 feet in thickness. In other places, extensive erosion caused the thickness to be highly variable.

The Cook Mountain Formation consists of clay, silt, and sand. Kingsbury and Parks (ref. 5) report a range of zero to 50 feet in the Memphis area, while Parks and Carmichael (ref. 6) report a thickness ranging from zero to 150 feet over the West Tennessee area.

Clayey soil that has been interpreted as the Jackson Formation/Upper Claiborne Group was penetrated in three soil borings and three monitoring wells. This unit is represented in the area included in this EE/CA by a distinctive stiff gray or orange low- to high-plasticity lignitic clay. This member underlies the fluvial deposits and is a regionally significant confining unit for the Memphis Sand Aquifer, which serves as the regional drinking water supply.

The Jackson Formation/Upper Claiborne Group has been observed to be continuous across the Main Installation with the possible exception of the northwest area near Dunn Field where the confining unit thins. Investigations to determine the nature of groundwater flow and quality in this area are ongoing. All wells and boreholes near Parcels 35 and 28 indicate that the clay is continuous in the southwest portion of the Main Installation.

Underlying the Jackson Formation/Upper Claiborne Group are the widespread terrace deposits of the Memphis Sand ("500-foot sand"). The Memphis Sand was deposited during the Middle Eocene when streams carried extensive quantities of sand and gravel into the Mississippi embayment area. The Memphis Sand unit is composed primarily of thick bedded, white to brown or gray, very fine-grained to gravelly, partly argillaceous, and micaceous sand. Lignitic clay beds constitute only a small percentage of total thickness. The

Memphis Sand ranges from 500 to 890 feet in thickness, and the depth to the top of the Memphis Sand Aquifer in the area ranges from approximately 120 to 300 feet below land surface (bls). It is thinnest in the northeastern part of the Memphis area in northwestern Fayette County, Tennessee, and thickest near the Mississippi River in southwestern Shelby County, Tennessee. The City of Memphis obtains its drinking water from this aquifer. The base of the Memphis Sand dips to the west at a rate of 20 to 50 feet per mile.

1.1.4.3 Regional Hydrogeology

The Memphis area is located within a region that has several aquifers of local and regional importance. These aquifers are identified in descending order by their geologic names:

- Alluvial Aquifer
- Fluvial (Terrace) Aquifer
- Memphis ("500-foot") Sand Aquifer
- Fort Pillow ("1,400-foot") Sand Aquifer

The Alluvial Aquifer's distribution is limited to the channels of primary streams; therefore, it does not occur at the Depot. The Fluvial, Memphis Sand, and Fort Pillow Sand aquifers underlie the Main Installation.

1.1.4.4 The Memphis Depot Hydrogeology

Site-specific hydrogeologic conditions were investigated by physical inspection, test borings, monitoring well installation, groundwater quality monitoring, and direct measurement of *in situ* hydraulic properties during the 1990 RI activities by Law Environmental (ref. 7).

The uppermost hydrogeologic unit encountered at the Memphis Depot is the loess. While not usually a water-bearing unit, this material is of interest because it tends to limit precipitation infiltration (recharge) to significant underlying aquifers where the loess remains intact or undisturbed. Sandy zones occurring within the loess may become seasonal "perched" water-bearing zones that contain water for short periods after rainfall events. Typically, the perched zones consisted of a fine sandy layer enclosed within the loess, approximately 20 feet bls. These perched water zones are temporal and are not considered part of the Fluvial Aquifer.

Fluvial (terrace) deposits underlie the loess within the Main Installation. The fluvial deposits form the Depot area's shallow (water table) aquifer. The base of the fluvial deposits range in depth from 40 to 131 feet bls at the Depot. The saturated thickness within the Fluvial Aquifer varies from a few feet to about 20 feet. Recharge to this unit is primarily from the infiltration of rainfall (ref. 1). According to the water levels measured in the monitoring wells during the 1990 RI activities (ref. 7), only the base of the unit is saturated. On the basis of water level measurements taken by CH2M HILL since 1996, seasonal water levels indicate that the groundwater levels fluctuate up to several feet. The Fluvial Aquifer is not used as a drinking water source within the City of Memphis. The Memphis Sand Aquifer underlies the Fluvial Aquifer and is the primary source of drinking water for the City of Memphis.

Water level data from Memphis Depot wells were used to prepare a water table surface map (ref. 8) of the Fluvial Aquifer underlying the Depot (Figure 1-8). This figure represents an interpolation of the water level information obtained from widely spaced monitoring wells and is an interpretation of natural conditions on the date of measurement. Figure 1-9 presents the interpretation of the Fluvial Aquifer water table surface within OU-2 during November 1998.

The Jackson Formation/Upper Claiborne Group was encountered at more than half the monitoring well and soil boring locations. The unit is significant because it is a regionally important confining bed separating shallow water-bearing zones from underlying major aquifers (ref. 4). Where encountered, the elevation of the confining unit's upper surface ranges from 223 to 118 feet above msl. An investigation to evaluate the presence of the confining unit and hydraulic communication (if any) between the Fluvial Aquifer and the Memphis Sand Aquifer is planned for other RI activities (RI for OU-4). The continuity and thickness of the confining unit can be only estimated from available information.

The Memphis Sand Aquifer (also called the "500-foot sand") represents the region's most important source of water resources. The aquifer is reported to underlie the entire Memphis area. At the Memphis Depot, the elevation of the top of the Memphis Sand Aquifer is approximately 125 to 150 feet above msl. In the monitoring wells, completed in the aquifer at the Depot, the potentiometric level ranges from 143 to 146 feet above msl. Flow in the unit is directed generally westward toward the Allen Well Field, a major local pumping zone.

The Fort Pillow Sand Aquifer (also called the "1,400-foot sand") underlies the Memphis Depot and the Memphis region at great depth, on the order of 1,400 feet bls, and is reported to average some 200 feet in thickness in the vicinity of the Depot. The unit contains groundwater under strong artesian (confined) conditions. The Fort Pillow Sand Aquifer potentiometric level in the Depot area was interpolated to be on the order of 180 feet above msl in the fall of 1985 (ref. 1).

1.1.5 Surrounding Land Use and Populations

The Memphis Depot is located in south-central Memphis in an area of widely varying uses. Most of the land surrounding the Depot is intensely developed. To the north of the Depot are the rail lines of Frisco Railroad and Illinois Central Gulf Railroad. Large industrial and warehousing operations are located along the rail lines in this area. A triangular area immediately to the north of the Depot along Dunn Road also contains several industrial firms. Formerly a residential neighborhood, the area is characterized by small commercial and manufacturing uses with a few single-family residences remaining.

Airways Boulevard is the most heavily traveled thoroughfare in the vicinity and is developed with numerous small commercial establishments. Businesses along Airways Boulevard are typical of highway commercial districts. Other commercial establishments are located to the north, south, and west of the Depot. Most are small groceries or convenience stores that serve their immediate neighborhoods.

The Depot is surrounded by residential development, including single- and multiple-family residences. Numerous small church buildings and schools are located throughout the area.

1.1.6 Sensitive Ecosystems

There is no undisturbed natural habitat within the site. The land use is highly developed and industrial in nature. Little vegetation is present.

CH2M HILL has not conducted a site-specific investigation of potentially occurring protected plant or animal species; however, the disturbed land-use conditions at this site are likely to preclude the incident of protected species. A more in-depth study will be done as part of the upcoming RI at the Main Installation.

1.1.7 Meteorology

This area of Tennessee experiences a continental climate with humid, warm summers and cold winters. The Memphis area receives an annual average of 50 inches of precipitation (30-year period of record) (ref. 9). Normally, precipitation is heaviest during the winter and early spring. The net annual precipitation (derived from gross annual precipitation less evaporation and runoff), as estimated for the Memphis area, is 9 inches (ref. 9).

1.2 Source, Nature, and Extent of Contamination

1.2.1 Sources of Contaminants

The primary source of contamination in Parcels 35 and 28 is the former industrial use of the area as a maintenance and storage area. This section summarizes the uses of the various facilities and the potential sources of contamination from each.

- Building 1084 – This building is reported to have been used as a maintenance shop, a wood shop, and a pesticide storage area in the past. Potential contaminants associated with these operations may include various pesticides, petroleum hydrocarbons, solvents, and metals. The Asbestos Identification Survey for the Depot (ref. 10) identified the roof flashing for Building 1084 as being asbestos-containing materials (ACMs).

- Building 1085 – This building was a former grease rack with a waste oil underground storage tank (UST) and a hydraulic oil UST. The waste oil UST, which was removed in 1989, is reported to have been the possible receptor of various liquids containing petroleum hydrocarbons, pesticides, polychlorinated biphenyls (PCBs), and metals. The hydraulic oil UST, which was closed in place, contained hydraulic oil for the hydraulic lift. No records exist concerning the condition of the USTs or the presence of subsurface contamination at the time of closure.

- Buildings 1086 and 1087 – These buildings were both used as spray painting facilities. Potential residues include organic constituents and metals associated with the equipment being painted. The Asbestos Identification Survey (ref. 10) identified duct insulation for the thermal system on top of Building 1087 as containing ACM. In addition, sediment sampling in the sump in Building 1086 revealed the presence of paint product remnants.

- Building 1088 – This building was the sandblast facility. Possible contaminants associated with this operation would be expected to include metals, paint residues, and solvent residues from equipment being sandblasted.
- Building 1089 – This building was used for the storage of various products. One product reported to have been stored in the past was acid materials. However, there is no record of the type or nature of these acid-containing materials and no evidence of acid residues or concrete etching from spills were noted. The two northern bays of this building contain the remnants of a sandblast area for small objects. Potential contaminants include residue from previously stored materials and metals, paint residues, or solvent residues from the sandblast operations.
- Buildings 1090 and 1091 – These buildings were used for storing paints and other supplies for the painting operation. Potential contaminants include metals, paint residues, and solvents from spills within the area.
- Gravel Driveways – Gravel driveways within the industrial area may have been potentially contaminated by metals, petroleum and solvent residues, or pesticide residues that may have been tracked, swept, or carried by drainage from the various operations discussed above; or, spilled from vehicles or containers being operated, stored, or transported in the area.

1.2.2 Nature of Contaminants

Various shallow soil-sampling activities have been performed in the gravel and grassed areas within, or adjacent to, Parcels 35 and 28. Results of the sampling indicate that the primary contaminants in the shallow soil (e.g., those up to 12 inches deep) are metals and polycyclic aromatic hydrocarbon (PAH) compounds. Specific information relative to these contaminants is discussed in the following section.

Except for sediment sampling in the sump in Building 1086, no sampling activities have been reported inside the various buildings. Visual observations within the buildings, however, indicate the presence of a heavy layer of dust and other residue on floor, wall, and equipment surfaces. This dust and residue can reasonably be expected to contain contaminants represented by the former use of the building and contaminants found in the nearby gravel areas. Since these buildings are constructed of concrete, metal, and similar materials, most contaminants should be contained in the past spill areas, dust (which is significant) in all buildings, debris, and drainage system sediment.

There is a potential that contaminated subsurface soil may be present in the vicinity of a previously covered area in Building 1084 and in the former and UST locations adjacent to the remaining slab for Building 1085. Contaminants in these areas, if present, are expected to be associated with constituents used or stored in the area.

1.2.3 Extent and Magnitude of Contamination

Approximately 60 surface soil samples have been collected at a depth of 12 inches in Parcels 35 and 28 within the fenced industrial area. Approximately 10 additional samples have been taken in the utility corridor outside the fence. Sampling locations are shown in Figure 1-10. Table 1-1 presents a list of sampling points where constituents were noted above analytical detection limits. Sixty-seven samples collected in Parcels 35 and 28 contained contaminant concentrations above their respective analytical detection limit (Table 1-1).

Surface soil samples indicate that surface soil (zero to 12 inches in depth) within the fenced industrial portion of Parcels 35 and 28 contains a variety of contaminants associated with the former functions of the area. The detected concentrations were distributed throughout the parcels and were not concentrated in any one particular area. In general, the most frequently detected constituents were metals (copper, cadmium, lead, mercury, nickel, and zinc). PAHs (benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and phenanthrene) were also detected in significant quantities. In addition, the samples contained sparse detected concentrations of volatile organic compounds (VOCs) (acetone, methylene chloride, methyl ethyl ketone, toluene); phthalates (bis(2-ethylhexyl)phthalate and di-n-butylphthalate); and pesticides (p,p'-DDE, p,p'-DDT, and dieldrin).

Concentrations ofPAHs and lead were detected in samples along Perry Road, within the grassed utility corridor outside the perimeter fence. The locations of the detected PAHs and lead concentrations suggest that they may be associated with traffic along Perry Road, and not the industrial operations within the industrial area. PAHs and lead are common constituents of exhaust gases from motor vehicles and are often found in significant concentrations along public roads. It is possible, however, that the elevated concentrations of PAHs and lead along the road may still be associated with industrial activities at the Depot because concentrations of these constituents from near-road samples adjacent to paint spraying and sandblasting operations are elevated relative to other samples near the road, but farther away from these operations. Additional sampling is needed within the utility corridor to determine the source of the elevated concentrations of PAHs and lead.

Figure 1-11 shows the extent of groundwater contamination and groundwater flow directions within Parcels 35 and 28. Analytical data and flow directions are taken from the October 1998 sampling effort. The extent of contamination is determined by the distribution of total volatile organic constituents presented in the figure. VOC concentrations in groundwater exceed EPA maximum contaminant levels (MCLs) of 5 micrograms per liter (μg/L) at offsite location PZ-04 (tetrachloroethylene at 110 μg/L) and MW-21 (tetrachloroethylene at 120 μg/L and trichloroethylene at 31 μg/L). Lead does not have an MCL; however, it has an action limit of 15 μg /L at the tap. This value is exceeded at MW-22 (22.8 μg/L). Flow directions have consistently been from the west and southwest towards the Main Installation as reported in 1990, 1997, and 1998 (ref. 7, 8, 11, 12). Therefore, transport of contamination to offsite receptors is limited due to the onsite flow directions of groundwater. Furthermore, there are no known uses of groundwater from the Fluvial Aquifer. Remediation of groundwater will not be considered in this Engineering Evaluation/Cost Analysis (EE/CA). Evaluation of the risks from groundwater at the Depot and the need for remedial actions, however, will be included in a remedial investigation/ feasibility study (RI/FS) report expected to be completed in January 2000.

1.2.4 Targets Potentially Affected by the Site

The expected future land use of the existing industrial areas of Parcels 35 and 28, including the grassed areas to the south and west within the perimeter fence, is industrial. Employees working within the industrial area of Parcels 35 and 28 will be the primary individuals encountering contamination within the area.

The utility corridor located outside the perimeter fence is uncontrolled and along a public road. As a result, the general public, including children, may encounter contamination located within that area.

1.2.5 Applicable or Relevant or Appropriate Requirements

The following list of applicable or relevant or appropriate requirements (ARARs) was developed based on the scope of work to be performed during the removal action:

- Contaminated soil and debris will be screened to determine if the material is characterized as a hazardous waste. Wastes will be characterized as hazardous if the appropriate analysis that determines the wastes are reactive, ignitable, corrosive, or toxic as described in the 40 CFR 261 Subpart D.
- Applicable Occupational Safety and Health Administration (OSHA) health and safety regulations will be followed during removal operations. Workers performing the removal actions will be properly trained and under appropriate medical supervision. Appropriate personal protective equipment (PPE) will be used and appropriate safe work practices will be followed.
- Asbestos-containing material will be packaged in leak-tight containers and disposed of in accordance with appropriate OSHA (40 CFR 61), EPA, state, and Memphis/Shelby County Health Department/Pollution Control Division requirements.
- Lead-based paint will be managed in accordance with appropriate OSHA, EPA, state, and Memphis/Shelby County Health Department/Pollution Control Division requirements.
- PCB-contaminated materials, if any, will be managed in accordance with the Toxic Substances Control Act (TSCA). PCB-contaminated materials that contain a PCB concentration of 50 parts per million or greater will be disposed of at a TSCA-permitted incinerator or a TSCA-permitted chemical waste landfill.
- The soil surrounding the present and former USTs will be removed to achieve the cleanup standards of the Tennessee Department of Environment and Conservation (TDEC). The TDEC cleanup levels for petroleum contamination are presented in Table 1-2. In addition, the soil will be subjected to a full scan of chemical analyses to identify other constituents that may be present. These constituents will be removed, as necessary, to achieve the cleanup standards outlined in Subsection 1.4.5.

- Water pollution control requirements of the federal Clean Water Act and National Pollutant Discharge Elimination System (NPDES), and applicable state and county requirements, will be followed.
- Applicable National Contingency Plan (NCP) requirements, including public comment period provisions, will be included as applicable.

1.3 Removal Action Potential

1.3.1 Previous Removal Actions

Known removal actions in the vicinity of Parcels 35 and 28 were limited to actions at Building 1085, the former grease rack:

- Removal of the above-grade structure hydraulic lift;
- Removal of a 1,000-gallon underground waste oil storage tank; and
- In-place closure of the underground hydraulic fluid tank for the hydraulic lift.

No information is available concerning who removed the structure or hydraulic lift at Building 1085. The exact date of removal is also unknown.

Underground storage tank records indicate that removal of the underground waste oil tank and in-place closure of the hydraulic fluid tank were done in 1989 by Memphis District, U.S. Army Corps of Engineers. No records of how the tanks were removed or closed are available. Inspection of the hydraulic tank, however, suggests that it was closed by filling it with sand, a common practice at that time. However, this has not been confirmed.

Outside of Parcels 35 and 28, the Depot recently completed a shallow soil removal action in the former base housing and the former cafeteria areas in Parcel 3 located on the Main Installation. Removal actions in the base housing area included the removal of up to 12 inches of surface soil containing the pesticide dieldrin, disposal of contaminated soil at a local industrial waste landfill, and backfill and restoration of the excavated areas. Because the restored area is to be used as a residential area, cleanup limits were based on risk-based residential screening criteria.

Removal actions at the former cafeteria area included the removal of 12 inches of PCB-contaminated soil, disposal of the soil at a local industrial waste landfill, and backfill and restoration of the excavated areas. Since the restored site is in a controlled-access area and will have a commercial application, cleanup limits were based on risk-based industrial screening criteria.

1.3.2 Treatability of Compounds

The preferred method of disposal of contaminated soil and debris from projects at the Memphis Depot has been at a local industrial waste landfill. The local industrial waste landfill, located approximately 10 miles from the Depot, is permitted to accept contaminated soil and debris that are not found to be hazardous when tested by the toxicity characteristics leaching procedure (TCLP). Use of the local industrial landfill provides significant (order of magnitude) savings on transportation and disposal costs and facilitates a more timely completion of the remediations.

On-site and off-site treatment options to landfilling may be potentially viable from a technical perspective, but the relatively small volume of soil and low-cost landfill available for removal projects at the Depot suggest that treatment options would not be a cost-effective solution. As a result, no treatment options were considered.

Several samples from Parcels 35 and 28 were collected and analyzed by the TCLP. Results of the TCLP were compared with Resource Conservation and Recovery Act (RCRA) regulatory limits for hazardous wastes. Results of detected TCLP concentrations are shown in Table 1-3. Nine locations contained detectable concentrations of RCRA TCLP contaminates, including arsenic, chromium, lead, and mercury (see Figure 1-10). None of the concentrations exceeded their respective RCRA regulatory limits for hazardous waste. This suggests that most residues from removal actions in Parcels 35 and 28 can likely be disposed of at the local industrial waste landfill.

There is a potential that small volumes of materials could be found to have characteristics of hazardous waste as defined by 40 CFR 261 Subpart C. These materials would be properly containerized, manifested, and shipped to a licensed hazardous waste landfill for disposal.

Removal actions are likely to generate contaminated water that must be appropriately treated. The local sewer authority has accepted contaminated water from past projects, provided that this water has been tested and found to be nonhazardous.

Should the water be found to be hazardous, there are two possible alternatives that could be considered:

- Shipment to a RCRA treatment facility licensed to treat and dispose of water exhibiting hazardous waste characteristics;
- Pretreatment (carbon adsorption, etc.) so that it can meet the disposal requirements of the local sewer authority.

Selection of the appropriate alternative will depend on economics and acceptability of pretreatment by regulatory agencies and the local sewage authority.

1.3.3 Equipment and Utilities at Site

The Memphis Depot is currently a federal facility that is in the process of being closed and turned over to civilian agencies and companies for alternative uses. The facility has well-developed utilities (gas, water, and electric) within, or near, the areas being remediated. Adequate covered and uncovered space is available for staging and storing remediation equipment and materials. Work areas are within a fenced area with security provided by government-supplied security guards.

The recent removal actions, such as the surface soil removal projects at the base housing area and the cafeteria area, have been done on a task-order basis with a service contractor contracted through the Mobile District, U.S. Army Corps of Engineers. It is assumed that future removal actions will be done under a similar contracting arrangement.

1.4 Risk-Based Cleanup Requirements

Areas requiring shallow soil removal within Parcels 28 and 35 were selected on the basis of risk-based screening criteria, future use, and potential access to areas of contamination. This section describes risk-based industrial and residential screening criteria, delineation of potential remediation areas represented by each, and the use of these delineations along with other factors to select areas requiring shallow soil remediation.

1.4.1 Industrial and Residential Screening Criteria

Industrial and residential screening criteria were developed for selected constituents based on background concentrations, BRAC Cleanup Team (BCT) screening values, and the most recent (October 1998) U.S. Environmental Protection Agency (EPA) Region III risk-based criteria (RBC) corresponding to a Hazard Index (HI) of 1.0. The industrial and residential screening criteria are shown in Table 1-4. If available, existing BCT screening values were used as both the industrial and residential screening criteria, except for chromium and lead, which are discussed below. If no BCT screening value existed, then the industrial screening criteria for a given contaminant equaled the greater of the EPA Region III Industrial RBC or the established background concentration. Likewise, the residential screening criteria for a given contaminant equaled the greater of the EPA Region III Residential RBC or the established background concentration. If no BCT screening value or EPA Region III RBC existed for a contaminant, then no industrial or residential screening criteria were developed for that contaminant.

The BCT screening value for chromium of 39 milligrams per kilogram (mg/kg) was significantly less than the EPA Region III RBC of 6,100 mg/kg for industrial sites and 230 mg/kg for residential sites. On the basis of this difference and the significant impact that the 39 mg/kg chromium standard would have on the volume of soil to be removed, the industrial and residential screening criteria for chromium were set to the EPA Region III RBC for industrial and residential sites, respectively.

The BCT screening value for lead was 400 mg/kg, based on the Region III residential exposure RBC. The EPA Region III RBC for lead is 1,000 mg/kg for industrial sites exposure. Therefore, evaluation of proposed soil removal quantities assuming industrial land use were based on a criteria of 1,000 mg/kg rather than the BCT criteria of 400 mg/kg.

1.4.2 Soil Samples Exceeding the Industrial Screening Criteria

Concentrations of previously collected surficial soil samples (zero to 1-foot interval) were compared to the industrial screening criteria described above. The sample locations that exceeded the industrial screening criteria are presented in Table 1-5 and shown in Figure 1-12. As shown in the table and figure, 16 sampling locations contained a contaminant concentration that exceeded the industrial screening criteria. Contaminants that exceeded the industrial screening criteria were aluminum, antimony, arsenic, benzo(a)pyrene, iron, lead, and phenanthrene. The ratio of the analytical concentration and the industrial screening criteria was calculated for each these contaminants. The analytical concentration/industrial screening criteria ratios varied from 1.03 to 6.93. The highest ratio (6.93) was observed for the benzo(a)pyrene concentration in the sample collected from SS32B. Furthermore, three of the four highest ratios (6.93, 4.32, and 3.75) were observed for benzo(a)pyrene concentrations (SS32B, SS32E, and SS31A, respectively). The sample collected from SB32A contained high ratios for antimony and lead (3.19 and 4.15, respectively), and the sample collected from C (35.2) contained a high ratio for arsenic (3.58).

Most of the sample locations that exceeded the industrial screening criteria were dispersed throughout the parcels except for the small clusters immediately east and west of Building 1087.

1.4.3 Soil Samples Exceeding the Residential Screening Criteria

The concentrations of the previously collected surficial soil samples were also compared to the residential screening criteria. The sampling locations that exceeded the residential screening criteria are presented in Table 1-6 and shown in Figure 1-13. As shown in the table and figure, 23 sampling locations contained a contaminant concentration that exceeded the residential screening criteria. Contaminants that exceeded the residential screening criteria were aluminum, antimony, arsenic, benzo(a)pyrene, total chromium, iron, lead, and phenanthrene. The ratio of the analytical concentration and the residential screening criteria was calculated for each these contaminants. The analytical concentration/residential screening criteria ratios varied from 1.03 to 10.38. The highest ratio (10.38) was observed for the lead concentration in the sample collected from SS32A. Furthermore, six of the nine highest ratios (5.58, 10.38, 3.95, 4.58, 6.18, and 5.63) were calculated for lead concentrations (FS33C, SB32A, SS32G, SS33K, SS89H, and SS89J, respectively). High ratios (6.93, 4.32, and 3.75) were also calculated for benzo(a)pyrene concentrations (SS32B, SS32E, and SS31A, respectively). In addition, SB32A contained high ratios for antimony and total chromium (3.19 and 3.98, respectively) and C (35.3) contained a high ratio for arsenic (3.58).

The sample locations that exceeded the residential screening criteria were fairly dispersed with small clusters located immediately east, southeast, and west of Building 1087, east and west of Building 1089, and south of Building 1084. As shown in Figures 1-12 and 1-13, the estimated areas where surface soil samples exceeded the residential screening criteria generally resembled the areas where industrial screening criteria were also exceeded.

It should be noted, however, that the horizontal limits of excavation described in this section are primarily for initial design and cost estimating purposes, because the contouring around the elevated concentrations assumed a homogeneous distribution of contamination. The actual horizontal extent of surface soil excavation will be determined by confirmation sampling.

1.4.4 Proposed Removal Action Limits for Shallow Soil Excavations

Contaminants in shallow surface soil within the fenced industrial portion of Parcels 35 and 28 are consistent with industrial activities that occurred within the area, and removal of contaminated surface soil is deemed appropriate. Because the area within the perimeter fence has a proposed future use as an industrial area, and access will be limited to the general public, it is proposed that contaminated surface soil exceeding the industrial screening criteria be removed within the industrial portion of Parcels 35 and 28. Figure 1-14 shows the estimated horizontal limits of excavation based on locations of samples exceeding industrial screening criteria in Figure 1-12.

On the basis of an excavation depth of zero to 1 foot and the estimated horizontal limits shown in Figure 1-14, the volume of soil that would be removed to achieve the industrial screening criteria is estimated to be approximately 600 cubic yards. This estimate did not include soil surrounding sample location B (28.1) because aluminum and iron were the only contaminants exceeding the industrial screening criteria at this location.

It should be noted, however, that the horizontal limits of excavation described in this section are primarily for initial design and cost estimating purposes, because the contouring around the elevated concentrations assumed a homogeneous distribution of contamination. The actual extent of surface soil excavation will be determined by confirmatory sampling.

As noted in Subsection 1.2.3, elevated concentrations of lead and PAHs within the grassed utility corridor outside the perimeter fence are suspected of being from traffic fumes along Perry Road, and not from activities within Parcels 35 and 28. However, insufficient information is available to confirm that the contamination is not also related to past paint spraying and sandblasting activities in Parcels 35 and 28.

It is recommended that the following activities be taken in the utility corridor:

- Additional surface soil sampling at locations between the perimeter fence and Perry Road determine if elevated concentrations of PAHs and lead are the result of paint spraying and sandblasting activities within the industrial portion of Parcels 35 and 28.
- No further action in the utility corridor if it is confirmed that elevated concentrations of PAHs and lead along Perry Road are not related to past activities within the industrial portion of Parcels 35 and 28.
- Removal of surface soil within the utility corridor to the residential screening criteria if it is confirmed that elevated concentrations of PAHs and lead are related to past activities within the industrial portion of Parcels 35 and 28.

1.4.5 Removal Action Limits for Other Work

Although shallow soil excavation is a primary component of the removal action, there are other components that also must be considered. These include:

- Decontamination of buildings, equipment, and slabs that will remain in-place; and
- Excavation of contaminated soil deeper than 12 inches in specific areas where past practices have led to zones of contamination (e.g., old UST at Building 1085 and old sump area at Building 1084).

Once buildings, equipment, and slabs have been decontaminated, wipe samples will be taken and analyzed to verify decontamination. Wipe sample results will be compared with the industrial screening criteria (Table 1-5) for constituents common to that building. Industrial screening criteria for surface soil is considered to be appropriate since the buildings are in a secured industrial area and the exposure pathway is similar to contact with soil in the area.

Limits of removal for excavations at Buildings 1085 and 1084 will be based on the UST Cleanup Standards for Soil (Table 1-2) and the industrial screening criteria (Table 1-5), as applicable.

Tables

Table 1-1
Detected Concentrations at Surface Soil Sampling Locations in Parcels 35 and 28

StationID	SampleID	DateCollected	ParamName	AnaValue	ProjQual	Units
A(28.1)	A106	10/18/96 10:17 AM	CALCIUM	104000	J	MG/KG
A(28.1)	DUP9	10/18/96 10:17 AM	CALCIUM	86400	J	MG/KG
A(28.1)	A106	10/18/96 10:17 AM	MAGNESIUM	4700	J	MG/KG
A(28.1)	A106	10/18/96 10:17 AM	ALUMINUM	3690	J	MG/KG
A(28.1)	DUP9	10/18/96 10:17 AM	ALUMINUM	2820	J	MG/KG
A(28.1)	A106	10/18/96 10:17 AM	ARSENIC	6.2	J	MG/KG
A(28.1)	DUP9	10/18/96 10:17 AM	ARSENIC	3.4	J	MG/KG
A(28.1)	A106	10/18/96 10:17 AM	BARIUM	63.1	J	MG/KG
A(28.1)	DUP9	10/18/96 10:17 AM	BARIUM	39.3	J	MG/KG
A(28.1)	A106	10/18/96 10:17 AM	BENZO(a)ANTHRACENE	0.056	J	MG/KG
A(28.1)	DUP9	10/18/96 10:17 AM	BENZO(a)ANTHRACENE	0.053	J	MG/KG
A(28.1)	A106	10/18/96 10:17 AM	BENZO(a)PYRENE	0.065	J	MG/KG
A(28.1)	DUP9	10/18/96 10:17 AM	BENZO(a)PYRENE	0.053	J	MG/KG
A(28.1)	A106	10/18/96 10:17 AM	BENZO(b)FLUORANTHENE	0.083	J	MG/KG
A(28.1)	DUP9	10/18/96 10:17 AM	BENZO(b)FLUORANTHENE	0.062	J	MG/KG
A(28.1)	A106	10/18/96 10:17 AM	BENZO(g,h,i)PERYLENE	0.072	J	MG/KG
A(28.1)	DUP9	10/18/96 10:17 AM	BENZO(g,h,i)PERYLENE	0.054	J	MG/KG
A(28.1)	A106	10/18/96 10:17 AM	BENZO(k)FLUORANTHENE	0.077	J	MG/KG
A(28.1)	DUP9	10/18/96 10:17 AM	BENZO(k)FLUORANTHENE	0.066	J	MG/KG
A(28.1)	A106	10/18/96 10:17 AM	BERYLLIUM	0.16	J	MG/KG
A(28.1)	DUP9	10/18/96 10:17 AM	BERYLLIUM	0.11	J	MG/KG
A(28.1)	A106	10/18/96 10:17 AM	CADMIUM	0.7	=	MG/KG
A(28.1)	DUP9	10/18/96 10:17 AM	CADMIUM	0.54	=	MG/KG
A(28.1)	A106	10/18/96 10:17 AM	CHROMIUM, TOTAL	19.9	J	MG/KG
A(28.1)	DUP9	10/18/96 10:17 AM	CHROMIUM, TOTAL	18.7	J	MG/KG
A(28.1)	A106	10/18/96 10:17 AM	CHRYSENE	0.088	J	MG/KG
A(28.1)	DUP9	10/18/96 10:17 AM	CHRYSENE	0.073	J	MG/KG
A(28.1)	A106	10/18/96 10:17 AM	COBALT	2.6	J	MG/KG
A(28.1)	DUP9	10/18/96 10:17 AM	COBALT	1.9	J	MG/KG
A(28.1)	A106	10/18/96 10:17 AM	COPPER	15.5	J	MG/KG
A(28.1)	DUP9	10/18/96 10:17 AM	COPPER	13.8	J	MG/KG
A(28.1)	A106	10/18/96 10:17 AM	DI-n-BUTYL PHTHALATE	0.21	J	MG/KG
A(28.1)	DUP9	10/18/96 10:17 AM	DI-n-BUTYL PHTHALATE	0.28	J	MG/KG
A(28.1)	A106	10/18/96 10:17 AM	FLUORANTHENE	0.14	J	MG/KG
A(28.1)	DUP9	10/18/96 10:17 AM	FLUORANTHENE	0.13	J	MG/KG
A(28.1)	A106	10/18/96 10:17 AM	INDENO(1,2,3-c,d)PYRENE	0.068	J	MG/KG
A(28.1)	DUP9	10/18/96 10:17 AM	INDENO(1,2,3-c,d)PYRENE	0.048	J	MG/KG
A(28.1)	A106	10/18/96 10:17 AM	IRON	9180	J	MG/KG
A(28.1)	DUP9	10/18/96 10:17 AM	IRON	7800	J	MG/KG
A(28.1)	A106	10/18/96 10:17 AM	LEAD	58.8	J	MG/KG
A(28.1)	DUP9	10/18/96 10:17 AM	LEAD	48.1	J	MG/KG
A(28.1)	DUP9	10/18/96 10:17 AM	MAGNESIUM	3350	J	MG/KG
A(28.1)	A106	10/18/96 10:17 AM	MANGANESE	186	J	MG/KG
A(28.1)	DUP9	10/18/96 10:17 AM	MANGANESE	131	J	MG/KG
A(28.1)	DUP9	10/18/96 10:17 AM	MERCURY	0.02	J	MG/KG
A(28.1)	A106	10/18/96 10:17 AM	NICKEL	13.2	=	MG/KG
A(28.1)	DUP9	10/18/96 10:17 AM	NICKEL	7.2	=	MG/KG
A(28.1)	A106	10/18/96 10:17 AM	PHENANTHRENE	0.07	J	MG/KG
A(28.1)	DUP9	10/18/96 10:17 AM	PHENANTHRENE	0.054	J	MG/KG

Table 1-1
Detected Concentrations at Surface Soil Sampling Locations in Parcels 35 and 28

StationID	SampleID	DateCollected	ParamName	AnaValue	ProjQual	Units
A(28.1)	A106	10/18/96 10:17 AM	POTASSIUM	496	J	MG/KG
A(28.1)	DUP9	10/18/96 10:17 AM	POTASSIUM	294	J	MG/KG
A(28.1)	A106	10/18/96 10:17 AM	PYRENE	0.13	J	MG/KG
A(28.1)	DUP9	10/18/96 10:17 AM	PYRENE	0.11	J	MG/KG
A(28.1)	A106	10/18/96 10:17 AM	TOLUENE	0.001	J	MG/KG
A(28.1)	A106	10/18/96 10:17 AM	VANADIUM	9.4	J	MG/KG
A(28.1)	DUP9	10/18/96 10:17 AM	VANADIUM	7.3	J	MG/KG
A(28.1)	A106	10/18/96 10:17 AM	ZINC	185	J	MG/KG
A(28.1)	DUP9	10/18/96 10:17 AM	ZINC	184	J	MG/KG
A(35.2)	DUP11	10/18/96 1:41 PM	CALCIUM	8940	J	MG/KG
A(35.2)	A129	10/18/96 1:41 PM	ALUMINUM	2840	J	MG/KG
A(35.2)	DUP11	10/18/96 1:41 PM	ALUMINUM	2830	J	MG/KG
A(35.2)	A129	10/18/96 1:41 PM	ANTIMONY	2.5	J	MG/KG
A(35.2)	A129	10/18/96 1:41 PM	ARSENIC	8.3	J	MG/KG
A(35.2)	DUP11	10/18/96 1:41 PM	ARSENIC	7.2	J	MG/KG
A(35.2)	A129	10/18/96 1:41 PM	BARIUM	31.5	J	MG/KG
A(35.2)	DUP11	10/18/96 1:41 PM	BARIUM	33.5	J	MG/KG
A(35.2)	A129	10/18/96 1:41 PM	bis(2-ETHYLHEXYL) PHTHALATE	16	=	MG/KG
A(35.2)	A129	10/18/96 1:41 PM	CADMIUM	1.1	=	MG/KG
A(35.2)	DUP11	10/18/96 1:41 PM	CADMIUM	0.95	=	MG/KG
A(35.2)	A129	10/18/96 1:41 PM	CALCIUM	5700	J	MG/KG
A(35.2)	A129	10/18/96 1:41 PM	CHROMIUM, TOTAL	27.3	J	MG/KG
A(35.2)	DUP11	10/18/96 1:41 PM	CHROMIUM, TOTAL	27	J	MG/KG
A(35.2)	A129	10/18/96 1:41 PM	COBALT	2.7	J	MG/KG
A(35.2)	DUP11	10/18/96 1:41 PM	COBALT	2.5	J	MG/KG
A(35.2)	A129	10/18/96 1:41 PM	COPPER	55.8	J	MG/KG
A(35.2)	DUP11	10/18/96 1:41 PM	COPPER	45.9	J	MG/KG
A(35.2)	DUP11	10/18/96 1:41 PM	DI-n-BUTYL PHTHALATE	0.17	J	MG/KG
A(35.2)	A129	10/18/96 1:41 PM	IRON	7730	J	MG/KG
A(35.2)	DUP11	10/18/96 1:41 PM	IRON	7630	J	MG/KG
A(35.2)	A129	10/18/96 1:41 PM	LEAD	201	J	MG/KG
A(35.2)	DUP11	10/18/96 1:41 PM	LEAD	144	J	MG/KG
A(35.2)	A129	10/18/96 1:41 PM	MAGNESIUM	1420	J	MG/KG
A(35.2)	DUP11	10/18/96 1:41 PM	MAGNESIUM	3910	J	MG/KG
A(35.2)	A129	10/18/96 1:41 PM	MANGANESE	86	J	MG/KG
A(35.2)	DUP11	10/18/96 1:41 PM	MANGANESE	81.8	J	MG/KG
A(35.2)	A129	10/18/96 1:41 PM	MERCURY	0.03	J	MG/KG
A(35.2)	DUP11	10/18/96 1:41 PM	MERCURY	0.06	J	MG/KG
A(35.2)	A129	10/18/96 1:41 PM	NICKEL	4.2	J	MG/KG
A(35.2)	DUP11	10/18/96 1:41 PM	NICKEL	3.9	J	MG/KG
A(35.2)	A129	10/18/96 1:41 PM	POTASSIUM	302	J	MG/KG
A(35.2)	DUP11	10/18/96 1:41 PM	POTASSIUM	265	J	MG/KG
A(35.2)	A129	10/18/96 1:41 PM	VANADIUM	11.1	J	MG/KG
A(35.2)	DUP11	10/18/96 1:41 PM	VANADIUM	10.8	J	MG/KG
A(35.2)	A129	10/18/96 1:41 PM	ZINC	212	J	MG/KG
A(35.2)	DUP11	10/18/96 1:41 PM	ZINC	263	J	MG/KG
A(35.3)	A130	10/18/96 1:21 PM	ANTIMONY	56.7	J	MG/KG
A(35.3)	A130	10/18/96 1:21 PM	BENZO(a)ANTHRACENE	1.2	J	MG/KG

Table 1-1
Detected Concentrations at Surface Soil Sampling Locations in Parcels 35 and 28

StationID	SampleID	DateCollected	ParamName	AnaValue	ProjQual	Units
A(35.3)	A130	10/18/96 1:21 PM	BENZO(a)PYRENE	0.84	J	MG/KG
A(35.3)	A130	10/18/96 1:21 PM	BENZO(b)FLUORANTHENE	1.4	J	MG/KG
A(35.3)	A130	10/18/96 1:21 PM	CADMIUM	168	=	MG/KG
A(35.3)	A130	10/18/96 1:21 PM	CALCIUM	31800	J	MG/KG
A(35.3)	A130	10/18/96 1:21 PM	CHROMIUM, TOTAL	3400	J	MG/KG
A(35.3)	A130	10/18/96 1:21 PM	IRON	49300	J	MG/KG
A(35.3)	A130	10/18/96 1:21 PM	LEAD	7640	J	MG/KG
A(35.3)	A130	10/18/96 1:21 PM	PHENANTHRENE	3.1	=	MG/KG
A(35.3)	A130	10/18/96 1:21 PM	2,4-DIMETHYLPHENOL	16	=	MG/KG
A(35.3)	A130	10/18/96 1:21 PM	2-METHYLNAPHTHALENE	8.2	=	MG/KG
A(35.3)	A130	10/18/96 1:21 PM	ACENAPHTHENE	0.39	J	MG/KG
A(35.3)	A130	10/18/96 1:21 PM	ALUMINUM	7090	J	MG/KG
A(35.3)	A130	10/18/96 1:21 PM	ANTHRACENE	0.51	J	MG/KG
A(35.3)	A130	10/18/96 1:21 PM	ARSENIC	11.7	J	MG/KG
A(35.3)	A130	10/18/96 1:21 PM	BARIUM	2240	J	MG/KG
A(35.3)	A130	10/18/96 1:21 PM	BENZO(k)FLUORANTHENE	1.1	J	MG/KG
A(35.3)	A130	10/18/96 1:21 PM	bis(2-ETHYLHEXYL)	12	=	MG/KG
A(35.3)	A130	10/18/96 1:21 PM	CARBAZOLE	0.4	J	MG/KG
A(35.3)	A130	10/18/96 1:21 PM	CHRYSENE	1.6	J	MG/KG
A(35.3)	A130	10/18/96 1:21 PM	COBALT	88.7	J	MG/KG
A(35.3)	A130	10/18/96 1:21 PM	COPPER	305	J	MG/KG
A(35.3)	A130	10/18/96 1:21 PM	DI-n-BUTYL PHTHALATE	0.3	J	MG/KG
A(35.3)	A130	10/18/96 1:21 PM	FLUORANTHENE	2.4	J	MG/KG
A(35.3)	A130	10/18/96 1:21 PM	FLUORENE	0.7	J	MG/KG
A(35.3)	A130	10/18/96 1:21 PM	ISOPHORONE	0.4	J	MG/KG
A(35.3)	A130	10/18/96 1:21 PM	MAGNESIUM	3180	J	MG/KG
A(35.3)	A130	10/18/96 1:21 PM	MANGANESE	448	J	MG/KG
A(35.3)	A130	10/18/96 1:21 PM	NAPHTHALENE	5.5	=	MG/KG
A(35.3)	A130	10/18/96 1:21 PM	NICKEL	59.5	=	MG/KG
A(35.3)	A130	10/18/96 1:21 PM	PYRENE	2.2	J	MG/KG
A(35.3)	A130	10/18/96 1:21 PM	SODIUM	2660	J	MG/KG
A(35.3)	A130	10/18/96 1:21 PM	ZINC	5100	J	MG/KG
B(28.1)	B106	10/18/96 1:02 PM	ALUMINUM	24700	J	MG/KG
B(28.1)	B106	10/18/96 1:02 PM	CALCIUM	24600	J	MG/KG
B(28.1)	B106	10/18/96 1:02 PM	IRON	38400	J	MG/KG
B(28.1)	B106	10/18/96 1:02 PM	MAGNESIUM	7200	J	MG/KG
B(28.1)	B106	10/18/96 1:02 PM	POTASSIUM	2650	=	MG/KG
B(28.1)	B106	10/18/96 1:02 PM	ARSENIC	17.6	J	MG/KG
B(28.1)	B106	10/18/96 1:02 PM	BARIUM	246	J	MG/KG
B(28.1)	B106	10/18/96 1:02 PM	BERYLLIUM	0.95	=	MG/KG
B(28.1)	B106	10/18/96 1:02 PM	CHROMIUM, TOTAL	26.1	J	MG/KG
B(28.1)	B106	10/18/96 1:02 PM	COBALT	13.7	J	MG/KG
B(28.1)	B106	10/18/96 1:02 PM	COPPER	34.5	J	MG/KG
B(28.1)	B106	10/18/96 1:02 PM	DI-n-BUTYL PHTHALATE	0.099	J	MG/KG
B(28.1)	B106	10/18/96 1:02 PM	LEAD	28.7	J	MG/KG
B(28.1)	B106	10/18/96 1:02 PM	MANGANESE	1100	J	MG/KG
B(28.1)	B106	10/18/96 1:02 PM	MERCURY	2.13	=	MG/KG
B(28.1)	B106	10/18/96 1:02 PM	NICKEL	37.4	=	MG/KG
B(28.1)	B106	10/18/96 1:02 PM	VANADIUM	49.8	J	MG/KG

Table 1-1
Detected Concentrations at Surface Soil Sampling Locations in Parcels 35 and 28

StationID	SampleID	DateCollected	ParamName	AnaValue	ProjQual	Units
B(28.1)	B106	10/18/96 1:02 PM	ZINC	128	J	MG/KG
B(35.2)	B129	10/18/96 1:55 PM	LEAD	744	J	MG/KG
B(35.2)	B129	10/18/96 1:55 PM	ALUMINUM	8650	J	MG/KG
B(35.2)	B129	10/18/96 1:55 PM	ARSENIC	6.6	J	MG/KG
B(35.2)	B129	10/18/96 1:55 PM	BARIUM	479	J	MG/KG
B(35.2)	B129	10/18/96 1:55 PM	BENZO(b)FLUORANTHENE	0.042	J	MG/KG
B(35.2)	B129	10/18/96 1:55 PM	CADMIUM	4.9	=	MG/KG
B(35.2)	B129	10/18/96 1:55 PM	CALCIUM	5470	J	MG/KG
B(35.2)	B129	10/18/96 1:55 PM	CHROMIUM, TOTAL	98	J	MG/KG
B(35.2)	B129	10/18/96 1:55 PM	COBALT	5.3	J	MG/KG
B(35.2)	B129	10/18/96 1:55 PM	COPPER	95.2	J	MG/KG
B(35.2)	B129	10/18/96 1:55 PM	DI-n-BUTYL PHTHALATE	0.13	J	MG/KG
B(35.2)	B129	10/18/96 1:55 PM	IRON	20200	J	MG/KG
B(35.2)	B129	10/18/96 1:55 PM	MAGNESIUM	1350	J	MG/KG
B(35.2)	B129	10/18/96 1:55 PM	MANGANESE	228	J	MG/KG
B(35.2)	B129	10/18/96 1:55 PM	MERCURY	0.28	=	MG/KG
B(35.2)	B129	10/18/96 1:55 PM	NICKEL	13.6	=	MG/KG
B(35.2)	B129	10/18/96 1:55 PM	PHENANTHRENE	0.043	J	MG/KG
B(35.2)	B129	10/18/96 1:55 PM	POTASSIUM	754	=	MG/KG
B(35.2)	B129	10/18/96 1:55 PM	VANADIUM	27.1	J	MG/KG
B(35.2)	B129	10/18/96 1:55 PM	ZINC	311	J	MG/KG
C(35.2)	C129	10/18/96 2:03 PM	ARSENIC	71.6	J	MG/KG
C(35.2)	C129	10/18/96 2:03 PM	CALCIUM	60200	J	MG/KG
C(35.2)	C129	10/18/96 2:03 PM	LEAD	550	J	MG/KG
C(35.2)	C129	10/18/96 2:03 PM	ALUMINUM	13600	J	MG/KG
C(35.2)	C129	10/18/96 2:03 PM	BARIUM	115	J	MG/KG
C(35.2)	C129	10/18/96 2:03 PM	BENZO(a)PYRENE	0.04	J	MG/KG
C(35.2)	C129	10/18/96 2:03 PM	BENZO(b)FLUORANTHENE	0.058	J	MG/KG
C(35.2)	C129	10/18/96 2:03 PM	BENZO(k)FLUORANTHENE	0.043	J	MG/KG
C(35.2)	C129	10/18/96 2:03 PM	CADMIUM	1.8	=	MG/KG
C(35.2)	C129	10/18/96 2:03 PM	CHROMIUM, TOTAL	122	J	MG/KG
C(35.2)	C129	10/18/96 2:03 PM	CHRYSENE	0.044	J	MG/KG
C(35.2)	C129	10/18/96 2:03 PM	COBALT	5.6	J	MG/KG
C(35.2)	C129	10/18/96 2:03 PM	COPPER	83.3	J	MG/KG
C(35.2)	C129	10/18/96 2:03 PM	DI-n-BUTYL PHTHALATE	0.18	J	MG/KG
C(35.2)	C129	10/18/96 2:03 PM	FLUORANTHENE	0.056	J	MG/KG
C(35.2)	C129	10/18/96 2:03 PM	IRON	24500	J	MG/KG
C(35.2)	C129	10/18/96 2:03 PM	MAGNESIUM	2400	J	MG/KG
C(35.2)	C129	10/18/96 2:03 PM	MANGANESE	534	J	MG/KG
C(35.2)	C129	10/18/96 2:03 PM	NICKEL	21.3	=	MG/KG
C(35.2)	C129	10/18/96 2:03 PM	POTASSIUM	1090	=	MG/KG
C(35.2)	C129	10/18/96 2:03 PM	PYRENE	0.05	J	MG/KG
C(35.2)	C129	10/18/96 2:03 PM	VANADIUM	25.2	J	MG/KG
C(35.2)	C129	10/18/96 2:03 PM	ZINC	463	J	MG/KG
FS33A	MIA337	10/8/98 10:50 AM	ANTIMONY	0.25	J	MG/KG
FS33A	MIA338	10/8/98 11:00 AM	ANTIMONY	0.21	J	MG/KG
FS33A	MIA337	10/8/98 10:50 AM	ARSENIC	3.2	=	MG/KG
FS33A	MIA337	10/8/98 10:50 AM	ARSENIC	4.8	=	MG/KG
FS33A	MIA337	10/8/98 10:50 AM	BERYLLIUM	0.25	J	MG/KG

Table 1-1
Detected Concentrations at Surface Soil Sampling Locations in Parcels 35 and 28

StationID	SampleID	DateCollected	ParamName	AnaValue	ProjQual	Units
FS33A	MIA338	10/8/98 11:00 AM	BERYLLIUM	0.31	J	MG/KG
FS33A	MIA337	10/8/98 10:50 AM	CADMIUM	0.27	J	MG/KG
FS33A	MIA338	10/8/98 11:00 AM	CADMIUM	3.1	J	MG/KG
FS33A	MIA337	10/8/98 10:50 AM	CHROMIUM, TOTAL	33.3	=	MG/KG
FS33A	MIA338	10/8/98 11:00 AM	CHROMIUM, TOTAL	23.2	=	MG/KG
FS33A	MIA337	10/8/98 10:50 AM	COPPER	18	=	MG/KG
FS33A	MIA338	10/8/98 11:00 AM	COPPER	15.1	=	MG/KG
FS33A	MIA337	10/8/98 10:50 AM	LEAD	141	=	MG/KG
FS33A	MIA338	10/8/98 11:00 AM	LEAD	86.8	=	MG/KG
FS33A	MIA337	10/8/98 10:50 AM	MERCURY	0.04	=	MG/KG
FS33A	MIA338	10/8/98 11:00 AM	MERCURY	0.04	=	MG/KG
FS33A	MIA337	10/8/98 10:50 AM	NICKEL	6.3	J	MG/KG
FS33A	MIA338	10/8/98 11:00 AM	NICKEL	6.6	J	MG/KG
FS33A	MIA338	10/8/98 11:00 AM	SELENIUM	1.2	=	MG/KG
FS33A	MIA337	10/8/98 10:50 AM	ZINC	61.4	J	MG/KG
FS33A	MIA338	10/8/98 11:00 AM	ZINC	300	J	MG/KG
FS33B	MIA340	10/6/98 2:40 PM	ARSENIC	9	=	MG/KG
FS33B	MIA341	10/6/98 2:45 PM	ARSENIC	4.5	=	MG/KG
FS33B	MIA340	10/6/98 2:40 PM	BERYLLIUM	0.26	J	MG/KG
FS33B	MIA341	10/6/98 2:45 PM	BERYLLIUM	0.16	J	MG/KG
FS33B	MIA340	10/6/98 2:40 PM	CADMIUM	0.75	=	MG/KG
FS33B	MIA341	10/6/98 2:45 PM	CADMIUM	0.03	J	MG/KG
FS33B	MIA340	10/6/98 2:40 PM	CHROMIUM, TOTAL	112	=	MG/KG
FS33B	MIA341	10/6/98 2:45 PM	CHROMIUM, TOTAL	15.3	=	MG/KG
FS33B	MIA340	10/6/98 2:40 PM	COPPER	33.8	=	MG/KG
FS33B	MIA341	10/6/98 2:45 PM	COPPER	7.4	=	MG/KG
FS33B	MIA340	10/6/98 2:40 PM	LEAD	368	=	MG/KG
FS33B	MIA341	10/6/98 2:45 PM	LEAD	54.3	=	MG/KG
FS33B	MIA341	10/6/98 2:45 PM	MERCURY	0.1	=	MG/KG
FS33B	MIA340	10/6/98 2:40 PM	NICKEL	12.9	=	MG/KG
FS33B	MIA341	10/6/98 2:45 PM	NICKEL	2.8	J	MG/KG
FS33B	MIA341	10/6/98 2:45 PM	SELENIUM	0.58	=	MG/KG
FS33B	MIA340	10/6/98 2:40 PM	ZINC	236	=	MG/KG
FS33B	MIA341	10/6/98 2:45 PM	ZINC	21.9	=	MG/KG
FS33C	MIA343	10/6/98 3:05 PM	CHROMIUM, TOTAL	522	=	MG/KG
FS33C	MIA343	10/6/98 3:05 PM	LEAD	2230	=	MG/KG
FS33C	MIA343	10/6/98 3:05 PM	ARSENIC	13.1	=	MG/KG
FS33C	MIA344	10/6/98 3:20 PM	ARSENIC	8.4	=	MG/KG
FS33C	MIA343	10/6/98 3:05 PM	BERYLLIUM	0.88	J	MG/KG
FS33C	MIA344	10/6/98 3:20 PM	BERYLLIUM	0.56	J	MG/KG
FS33C	MIA343	10/6/98 3:05 PM	CADMIUM	4.1	=	MG/KG
FS33C	MIA344	10/6/98 3:20 PM	CHROMIUM, TOTAL	15.4	=	MG/KG
FS33C	MIA343	10/6/98 3:05 PM	COPPER	62.6	=	MG/KG
FS33C	MIA344	10/6/98 3:20 PM	COPPER	14.9	=	MG/KG
FS33C	MIA344	10/6/98 3:20 PM	LEAD	32	=	MG/KG
FS33C	MIA343	10/6/98 3:05 PM	MERCURY	0.12	=	MG/KG
FS33C	MIA344	10/6/98 3:20 PM	MERCURY	0.02	J	MG/KG
FS33C	MIA343	10/6/98 3:05 PM	NICKEL	28.7	=	MG/KG
FS33C	MIA344	10/6/98 3:20 PM	NICKEL	15.4	=	MG/KG

Table 1-1
Detected Concentrations at Surface Soil Sampling Locations in Parcels 35 and 28

StationID	SampleID	DateCollected	ParamName	AnaValue	ProjQual	Units
FS33C	MIA344	10/6/98 3:20 PM	SELENIUM	0.69	=	MG/KG
FS33C	MIA343	10/6/98 3:05 PM	ZINC	1100	=	MG/KG
FS33C	MIA344	10/6/98 3:20 PM	ZINC	75.2	=	MG/KG
FS33D	MIA347	10/5/98 4:15 PM	LEAD	667	=	MG/KG
FS33D	MIA346	10/5/98 4:05 PM	ARSENIC	8.9	=	MG/KG
FS33D	MIA347	10/5/98 4:15 PM	ARSENIC	18.1	=	MG/KG
FS33D	MIA346	10/5/98 4:05 PM	BERYLLIUM	0.73	=	MG/KG
FS33D	MIA347	10/5/98 4:15 PM	BERYLLIUM	0.79	=	MG/KG
FS33D	MIA346	10/5/98 4:05 PM	CADMIUM	0.28	J	MG/KG
FS33D	MIA347	10/5/98 4:15 PM	CADMIUM	0.49	J	MG/KG
FS33D	MIA346	10/5/98 4:05 PM	CHROMIUM, TOTAL	211	=	MG/KG
FS33D	MIA347	10/5/98 4:15 PM	CHROMIUM, TOTAL	221	=	MG/KG
FS33D	MIA346	10/5/98 4:05 PM	COPPER	54.1	=	MG/KG
FS33D	MIA347	10/5/98 4:15 PM	COPPER	70.5	=	MG/KG
FS33D	MIA346	10/5/98 4:05 PM	LEAD	338	=	MG/KG
FS33D	MIA346	10/5/98 4:05 PM	MERCURY	0.04	=	MG/KG
FS33D	MIA347	10/5/98 4:15 PM	MERCURY	0.07	=	MG/KG
FS33D	MIA346	10/5/98 4:05 PM	NICKEL	21	=	MG/KG
FS33D	MIA347	10/5/98 4:15 PM	NICKEL	24	=	MG/KG
FS33D	MIA347	10/5/98 4:15 PM	SELENIUM	1.5	=	MG/KG
FS33D	MIA346	10/5/98 4:05 PM	ZINC	562	=	MG/KG
FS33D	MIA347	10/5/98 4:15 PM	ZINC	509	=	MG/KG
FS33E	MIA349	10/8/98 10:00 AM	ANTIMONY	0.48	J	MG/KG
FS33E	MIA350	10/8/98 10:15 AM	ANTIMONY	0.42	J	MG/KG
FS33E	MIA349	10/8/98 10:00 AM	ARSENIC	8	=	MG/KG
FS33E	MIA350	10/8/98 10:15 AM	ARSENIC	10	=	MG/KG
FS33E	MIA349	10/8/98 10:00 AM	BERYLLIUM	0.42	J	MG/KG
FS33E	MIA350	10/8/98 10:15 AM	BERYLLIUM	0.47	J	MG/KG
FS33E	MIA349	10/8/98 10:00 AM	CADMIUM	0.14	J	MG/KG
FS33E	MIA350	10/8/98 10:15 AM	CADMIUM	0.11	J	MG/KG
FS33E	MIA349	10/8/98 10:00 AM	CHROMIUM, TOTAL	13.8	=	MG/KG
FS33E	MIA350	10/8/98 10:15 AM	CHROMIUM, TOTAL	13.9	=	MG/KG
FS33E	MIA349	10/8/98 10:00 AM	COPPER	14	=	MG/KG
FS33E	MIA350	10/8/98 10:15 AM	COPPER	14.4	=	MG/KG
FS33E	MIA349	10/8/98 10:00 AM	LEAD	27.9	=	MG/KG
FS33E	MIA350	10/8/98 10:15 AM	LEAD	15.8	=	MG/KG
FS33E	MIA350	10/8/98 10:15 AM	MERCURY	0.03	J	MG/KG
FS33E	MIA350	10/8/98 10:15 AM	NICKEL	13.6	=	MG/KG
FS33E	MIA349	10/8/98 10:00 AM	NICKEL	12.6	J	MG/KG
FS33E	MIA349	10/8/98 10:00 AM	SELENIUM	1	=	MG/KG
FS33E	MIA350	10/8/98 10:15 AM	SELENIUM	0.97	=	MG/KG
FS33E	MIA349	10/8/98 10:00 AM	ZINC	57.4	J	MG/KG
FS33E	MIA350	10/8/98 10:15 AM	ZINC	44.3	J	MG/KG
FS33F	MIA352	10/5/98 5:00 PM	ARSENIC	8.6	=	MG/KG
FS33F	MIA353	10/5/98 5:30 PM	ARSENIC	5.9	=	MG/KG
FS33F	MIA352	10/5/98 5:00 PM	BERYLLIUM	0.43	J	MG/KG
FS33F	MIA353	10/5/98 5:30 PM	BERYLLIUM	0.41	J	MG/KG
FS33F	MIA352	10/5/98 5:00 PM	CHROMIUM, TOTAL	116	=	MG/KG
FS33F	MIA353	10/5/98 5:30 PM	CHROMIUM, TOTAL	48.6	=	MG/KG

Table 1-1
Detected Concentrations at Surface Soil Sampling Locations in Parcels 35 and 28

StationID	SampleID	DateCollected	ParamName	AnaValue	ProjQual	Units
FS33F	MIA352	10/5/98 5:00 PM	COPPER	83.7	=	MG/KG
FS33F	MIA353	10/5/98 5:30 PM	COPPER	74.8	=	MG/KG
FS33F	MIA352	10/5/98 5:00 PM	LEAD	156	=	MG/KG
FS33F	MIA353	10/5/98 5:30 PM	LEAD	120	=	MG/KG
FS33F	MIA353	10/5/98 5:30 PM	MERCURY	0.04	=	MG/KG
FS33F	MIA352	10/5/98 5:00 PM	MERCURY	0.02	J	MG/KG
FS33F	MIA352	10/5/98 5:00 PM	NICKEL	38	=	MG/KG
FS33F	MIA353	10/5/98 5:30 PM	NICKEL	18.8	=	MG/KG
FS33F	MIA352	10/5/98 5:00 PM	SELENIUM	0.65	=	MG/KG
FS33F	MIA353	10/5/98 5:30 PM	SELENIUM	1.1	=	MG/KG
FS33F	MIA352	10/5/98 5:00 PM	ZINC	175	=	MG/KG
FS33F	MIA353	10/5/98 5:30 PM	ZINC	86.3	=	MG/KG
FS87A	MIA104	10/6/98 1:15 PM	p,p'-DDE	0.021	=	MG/KG
FS87A	MIA105	10/6/98 1:25 PM	p,p'-DDE	0.0018	J	MG/KG
FS87A	MIA104	10/6/98 1:15 PM	p,p'-DDT	0.054	=	MG/KG
FS87A	MIA105	10/6/98 1:25 PM	p,p'-DDT	0.0027	J	MG/KG
FS87B	MIA107	10/6/98 1:50 PM	p,p'-DDE	0.0044	J	MG/KG
FS87B	MIA107	10/6/98 1:50 PM	p,p'-DDT	0.015	J	MG/KG
FS89P	MIA159	10/8/98 9:00 AM	CHROMIUM, TOTAL	233	=	MG/KG
FS89P	MIA159	10/8/98 9:00 AM	LEAD	828	=	MG/KG
FS89P	MIA160FD	10/8/98 9:00 AM	LEAD	798	=	MG/KG
FS89P	MIA159	10/8/98 9:00 AM	ANTIMONY	3	J	MG/KG
FS89P	MIA160FD	10/8/98 9:00 AM	ANTIMONY	4.5	J	MG/KG
FS89P	MIA162	10/8/98 9:30 AM	ANTIMONY	0.58	J	MG/KG
FS89P	MIA159	10/8/98 9:00 AM	ARSENIC	19	=	MG/KG
FS89P	MIA160FD	10/8/98 9:00 AM	ARSENIC	14.7	=	MG/KG
FS89P	MIA162	10/8/98 9:30 AM	ARSENIC	7	=	MG/KG
FS89P	MIA160FD	10/8/98 9:00 AM	BERYLLIUM	0.26	J	MG/KG
FS89P	MIA162	10/8/98 9:30 AM	BERYLLIUM	0.4	J	MG/KG
FS89P	MIA159	10/8/98 9:00 AM	CADMIUM	0.66	J	MG/KG
FS89P	MIA160FD	10/8/98 9:00 AM	CADMIUM	1.3	J	MG/KG
FS89P	MIA162	10/8/98 9:30 AM	CADMIUM	0.12	J	MG/KG
FS89P	MIA160FD	10/8/98 9:00 AM	CHROMIUM, TOTAL	187	=	MG/KG
FS89P	MIA162	10/8/98 9:30 AM	CHROMIUM, TOTAL	19.8	=	MG/KG
FS89P	MIA159	10/8/98 9:00 AM	COPPER	208	J	MG/KG
FS89P	MIA160FD	10/8/98 9:00 AM	COPPER	153	J	MG/KG
FS89P	MIA162	10/8/98 9:30 AM	COPPER	15.5	J	MG/KG
FS89P	MIA162	10/8/98 9:30 AM	LEAD	44.1	=	MG/KG
FS89P	MIA159	10/8/98 9:00 AM	NICKEL	59.9	J	MG/KG
FS89P	MIA160FD	10/8/98 9:00 AM	NICKEL	38.6	J	MG/KG
FS89P	MIA162	10/8/98 9:30 AM	NICKEL	15.4	J	MG/KG
FS89P	MIA162	10/8/98 9:30 AM	SELENIUM	1.2	=	MG/KG
FS89P	MIA159	10/8/98 9:00 AM	SELENIUM	1.6	J	MG/KG
FS89P	MIA160FD	10/8/98 9:00 AM	SELENIUM	1.1	J	MG/KG
FS89P	MIA160FD	10/8/98 9:00 AM	SILVER	0.91	J	MG/KG
FS89P	MIA159	10/8/98 9:00 AM	ZINC	340	J	MG/KG
FS89P	MIA160FD	10/8/98 9:00 AM	ZINC	251	J	MG/KG
FS89P	MIA162	10/8/98 9:30 AM	ZINC	49.8	J	MG/KG
FS89Q	MIA164	10/8/98 1:45 PM	LEAD	897	=	MG/KG

Table 1-1
Detected Concentrations at Surface Soil Sampling Locations in Parcels 35 and 28

StationID	SampleID	DateCollected	ParamName	AnaValue	ProjQual	Units
FS89Q	MIA165	10/8/98 2:00 PM	ANTIMONY	0.23	J	MG/KG
FS89Q	MIA164	10/8/98 1:45 PM	ARSENIC	7.2	=	MG/KG
FS89Q	MIA165	10/8/98 2:00 PM	ARSENIC	5.8	=	MG/KG
FS89Q	MIA164	10/8/98 1:45 PM	BERYLLIUM	0.3	J	MG/KG
FS89Q	MIA165	10/8/98 2:00 PM	BERYLLIUM	0.34	J	MG/KG
FS89Q	MIA164	10/8/98 1:45 PM	CADMIUM	1.1	J	MG/KG
FS89Q	MIA165	10/8/98 2:00 PM	CADMIUM	0.11	J	MG/KG
FS89Q	MIA164	10/8/98 1:45 PM	CHROMIUM, TOTAL	159	=	MG/KG
FS89Q	MIA165	10/8/98 2:00 PM	CHROMIUM, TOTAL	18.7	=	MG/KG
FS89Q	MIA164	10/8/98 1:45 PM	COPPER	16.8	J	MG/KG
FS89Q	MIA165	10/8/98 2:00 PM	COPPER	11.3	J	MG/KG
FS89Q	MIA165	10/8/98 2:00 PM	LEAD	71.1	=	MG/KG
FS89Q	MIA164	10/8/98 1:45 PM	NICKEL	9.4	J	MG/KG
FS89Q	MIA165	10/8/98 2:00 PM	NICKEL	10.8	J	MG/KG
FS89Q	MIA164	10/8/98 1:45 PM	SELENIUM	1.3	=	MG/KG
FS89Q	MIA165	10/8/98 2:00 PM	SELENIUM	1.1	=	MG/KG
FS89Q	MIA164	10/8/98 1:45 PM	ZINC	1010	J	MG/KG
FS89Q	MIA165	10/8/98 2:00 PM	ZINC	59.4	J	MG/KG
FS89R	MIA167	10/8/98 11:35 AM	ANTIMONY	0.49	J	MG/KG
FS89R	MIA167	10/8/98 11:35 AM	ARSENIC	7.1	=	MG/KG
FS89R	MIA168	10/8/98 11:45 AM	ARSENIC	6.1	=	MG/KG
FS89R	MIA167	10/8/98 11:35 AM	BERYLLIUM	0.41	J	MG/KG
FS89R	MIA168	10/8/98 11:45 AM	BERYLLIUM	0.42	J	MG/KG
FS89R	MIA167	10/8/98 11:35 AM	CADMIUM	0.57	J	MG/KG
FS89R	MIA168	10/8/98 11:45 AM	CADMIUM	0.17	J	MG/KG
FS89R	MIA167	10/8/98 11:35 AM	CHROMIUM, TOTAL	23	=	MG/KG
FS89R	MIA168	10/8/98 11:45 AM	CHROMIUM, TOTAL	12.5	=	MG/KG
FS89R	MIA167	10/8/98 11:35 AM	COPPER	18.4	J	MG/KG
FS89R	MIA168	10/8/98 11:45 AM	COPPER	13.8	J	MG/KG
FS89R	MIA167	10/8/98 11:35 AM	LEAD	64.1	=	MG/KG
FS89R	MIA168	10/8/98 11:45 AM	LEAD	9.1	=	MG/KG
FS89R	MIA167	10/8/98 11:35 AM	NICKEL	14.5	J	MG/KG
FS89R	MIA168	10/8/98 11:45 AM	NICKEL	15	J	MG/KG
FS89R	MIA167	10/8/98 11:35 AM	SELENIUM	1.1	=	MG/KG
FS89R	MIA168	10/8/98 11:45 AM	SELENIUM	0.6	=	MG/KG
FS89R	MIA167	10/8/98 11:35 AM	ZINC	204	J	MG/KG
FS89R	MIA168	10/8/98 11:45 AM	ZINC	48.9	J	MG/KG
FS89S	MIA171FD	10/8/98 4:10 PM	ANTIMONY	0.46	J	MG/KG
FS89S	MIA172	10/8/98 4:30 PM	ANTIMONY	0.32	J	MG/KG
FS89S	MIA170	10/8/98 4:10 PM	ARSENIC	6.4	=	MG/KG
FS89S	MIA171FD	10/8/98 4:10 PM	ARSENIC	7.1	=	MG/KG
FS89S	MIA172	10/8/98 4:30 PM	ARSENIC	6.1	=	MG/KG
FS89S	MIA170	10/8/98 4:10 PM	BERYLLIUM	0.37	J	MG/KG
FS89S	MIA171FD	10/8/98 4:10 PM	BERYLLIUM	0.33	J	MG/KG
FS89S	MIA172	10/8/98 4:30 PM	BERYLLIUM	0.37	J	MG/KG
FS89S	MIA170	10/8/98 4:10 PM	CADMIUM	0.49	J	MG/KG
FS89S	MIA171FD	10/8/98 4:10 PM	CADMIUM	0.7	J	MG/KG
FS89S	MIA172	10/8/98 4:30 PM	CADMIUM	0.12	J	MG/KG
FS89S	MIA170	10/8/98 4:10 PM	CHROMIUM, TOTAL	17.9	=	MG/KG

Table 1-1
Detected Concentrations at Surface Soil Sampling Locations in Parcels 35 and 28

StationID	SampleID	DateCollected	ParamName	AnaValue	ProjQual	Units
FS89S	MIA171FD	10/8/98 4:10 PM	CHROMIUM, TOTAL	17.6	=	MG/KG
FS89S	MIA172	10/8/98 4:30 PM	CHROMIUM, TOTAL	25.5	=	MG/KG
FS89S	MIA170	10/8/98 4:10 PM	COPPER	12.9	J	MG/KG
FS89S	MIA171FD	10/8/98 4:10 PM	COPPER	15.6	J	MG/KG
FS89S	MIA172	10/8/98 4:30 PM	COPPER	14	J	MG/KG
FS89S	MIA170	10/8/98 4:10 PM	LEAD	34.1	=	MG/KG
FS89S	MIA171FD	10/8/98 4:10 PM	LEAD	44.9	=	MG/KG
FS89S	MIA172	10/8/98 4:30 PM	LEAD	88.4	=	MG/KG
FS89S	MIA170	10/8/98 4:10 PM	NICKEL	14.5	J	MG/KG
FS89S	MIA171FD	10/8/98 4:10 PM	NICKEL	13.2	J	MG/KG
FS89S	MIA172	10/8/98 4:30 PM	NICKEL	10.9	J	MG/KG
FS89S	MIA172	10/8/98 4:30 PM	SELENIUM	1.2	=	MG/KG
FS89S	MIA170	10/8/98 4:10 PM	ZINC	235	J	MG/KG
FS89S	MIA171FD	10/8/98 4:10 PM	ZINC	329	J	MG/KG
FS89S	MIA172	10/8/98 4:30 PM	ZINC	52	J	MG/KG
SB31A	SGA015	12/18/96 8:40 AM	ARSENIC	20.6	=	MG/KG
SB31A	SGA487FD1	12/18/96 8:40 AM	ACETONE	0.007	J	MG/KG
SB31A	SGA487FD1	12/18/96 8:40 AM	ARSENIC	8.5	=	MG/KG
SB31A	SGA015	12/18/96 8:40 AM	CHROMIUM, TOTAL	38.7	=	MG/KG
SB31A	SGA487FD1	12/18/96 8:40 AM	CHROMIUM, TOTAL	34.7	=	MG/KG
SB31A	SGA015	12/18/96 8:40 AM	COPPER	32	=	MG/KG
SB31A	SGA487FD1	12/18/96 8:40 AM	COPPER	23.7	=	MG/KG
SB31A	SGA015	12/18/96 8:40 AM	LEAD	51.4	=	MG/KG
SB31A	SGA487FD1	12/18/96 8:40 AM	LEAD	57.2	=	MG/KG
SB31A	SGA015	12/18/96 8:40 AM	NICKEL	34	=	MG/KG
SB31A	SGA487FD1	12/18/96 8:40 AM	NICKEL	33.8	=	MG/KG
SB31A	SGA015	12/18/96 8:40 AM	ZINC	118	=	MG/KG
SB31A	SGA487FD1	12/18/96 8:40 AM	ZINC	97.1	=	MG/KG
SB31B	SGA020	12/18/96 9:45 AM	ARSENIC	14.9	=	MG/KG
SB31B	SGA020	12/18/96 9:45 AM	CHROMIUM, TOTAL	29.8	=	MG/KG
SB31B	SGA020	12/18/96 9:45 AM	COPPER	26.7	=	MG/KG
SB31B	SGA020	12/18/96 9:45 AM	LEAD	37.3	=	MG/KG
SB31B	SGA020	12/18/96 9:45 AM	NICKEL	26.9	=	MG/KG
SB31B	SGA020	12/18/96 9:45 AM	ZINC	104	=	MG/KG
SB32A	RHA012	1/18/97 2:40 PM	ANTIMONY	22.3	=	MG/KG
SB32A	RHA012	1/18/97 2:40 PM	ARSENIC	42.5	=	MG/KG
SB32A	RHA012	1/18/97 2:40 PM	BENZO(a)PYRENE	0.16	=	MG/KG
SB32A	RHA012	1/18/97 2:40 PM	CHROMIUM, TOTAL	915	=	MG/KG
SB32A	RHA012	1/18/97 2:40 PM	LEAD	4150	=	MG/KG
SB32A	RHA012	1/18/97 2:40 PM	ACENAPHTHENE	0.068	=	MG/KG
SB32A	RHA012	1/18/97 2:40 PM	ANTHRACENE	0.07	=	MG/KG
SB32A	RHA012	1/18/97 2:40 PM	BENZO(a)ANTHRACENE	0.15	=	MG/KG
SB32A	RHA012	1/18/97 2:40 PM	BENZO(b)FLUORANTHENE	0.14	=	MG/KG
SB32A	RHA012	1/18/97 2:40 PM	BENZO(g,h,i)PERYLENE	0.14	=	MG/KG
SB32A	RHA012	1/18/97 2:40 PM	BENZO(k)FLUORANTHENE	0.13	=	MG/KG
SB32A	RHA012	1/18/97 2:40 PM	CADMIUM	5.8	=	MG/KG
SB32A	RHA012	1/18/97 2:40 PM	CHRYSENE	0.17	=	MG/KG
SB32A	RHA012	1/18/97 2:40 PM	COPPER	235	=	MG/KG
SB32A	RHA012	1/18/97 2:40 PM	FLUORANTHENE	0.37	=	MG/KG

Table 1-1
Detected Concentrations at Surface Soil Sampling Locations in Parcels 35 and 28

StationID	SampleID	DateCollected	ParamName	AnaValue	ProjQual	Units
SB32A	RHA012	1/18/97 2:40 PM	FLUORENE	0.094	=	MG/KG
SB32A	RHA012	1/18/97 2:40 PM	INDENO(1,2,3-c,d)PYRENE	0.15	=	MG/KG
SB32A	RHA012	1/18/97 2:40 PM	NAPHTHALENE	0.16	=	MG/KG
SB32A	RHA012	1/18/97 2:40 PM	NICKEL	76.3	=	MG/KG
SB32A	RHA012	1/18/97 2:40 PM	PHENANTHRENE	0.38	=	MG/KG
SB32A	RHA012	1/18/97 2:40 PM	PYRENE	0.26	=	MG/KG
SB32A	RHA012	1/18/97 2:40 PM	SILVER	2.5	=	MG/KG
SB32A	RHA012	1/18/97 2:40 PM	ZINC	1460	=	MG/KG
SB33A	SGA031	12/18/96 1:20 PM	ARSENIC	10.2	=	MG/KG
SB33A	SGA031	12/18/96 1:20 PM	CHROMIUM, TOTAL	32.2	=	MG/KG
SB33A	SGA031	12/18/96 1:20 PM	COPPER	26.1	=	MG/KG
SB33A	SGA031	12/18/96 1:20 PM	LEAD	46.9	=	MG/KG
SB33A	SGA031	12/18/96 1:20 PM	NICKEL	27.5	=	MG/KG
SB33A	SGA031	12/18/96 1:20 PM	ZINC	93.3	=	MG/KG
SB33B	SGA488FD1	12/18/96 2:40 PM	ACETONE	0.012	=	MG/KG
SB33B	SGA036	12/18/96 2:40 PM	ARSENIC	9.9	=	MG/KG
SB33B	SGA488FD1	12/18/96 2:40 PM	ARSENIC	13.9	=	MG/KG
SB33B	SGA036	12/18/96 2:40 PM	BERYLLIUM	0.95	=	MG/KG
SB33B	SGA488FD1	12/18/96 2:40 PM	BERYLLIUM	1.1	=	MG/KG
SB33B	SGA036	12/18/96 2:40 PM	CHROMIUM, TOTAL	28.3	=	MG/KG
SB33B	SGA488FD1	12/18/96 2:40 PM	CHROMIUM, TOTAL	40.5	=	MG/KG
SB33B	SGA036	12/18/96 2:40 PM	COPPER	22	=	MG/KG
SB33B	SGA488FD1	12/18/96 2:40 PM	COPPER	39	=	MG/KG
SB33B	SGA036	12/18/96 2:40 PM	LEAD	20.1	=	MG/KG
SB33B	SGA488FD1	12/18/96 2:40 PM	LEAD	119	=	MG/KG
SB33B	SGA036	12/18/96 2:40 PM	METHYLENE CHLORIDE	0.003	J	MG/KG
SB33B	SGA488FD1	12/18/96 2:40 PM	METHYLENE CHLORIDE	0.006	J	MG/KG
SB33B	SGA036	12/18/96 2:40 PM	NICKEL	30.5	=	MG/KG
SB33B	SGA488FD1	12/18/96 2:40 PM	NICKEL	26.2	=	MG/KG
SB33B	SGA488FD1	12/18/96 2:40 PM	SELENIUM	1.3	=	MG/KG
SB33B	SGA036	12/18/96 2:40 PM	TOLUENE	0.001	J	MG/KG
SB33B	SGA036	12/18/96 2:40 PM	ZINC	79.7	=	MG/KG
SB33B	SGA488FD1	12/18/96 2:40 PM	ZINC	124	=	MG/KG
SB33C	SGA041	12/19/96 2:35 PM	ACETONE	0.003	J	MG/KG
SB33C	SGA041	12/19/96 2:35 PM	ARSENIC	8.7	=	MG/KG
SB33C	SGA041	12/19/96 2:35 PM	BERYLLIUM	0.99	=	MG/KG
SB33C	SGA041	12/19/96 2:35 PM	CADMIUM	1.2	=	MG/KG
SB33C	SGA041	12/19/96 2:35 PM	CHROMIUM, TOTAL	37.6	=	MG/KG
SB33C	SGA041	12/19/96 2:35 PM	COPPER	17.1	=	MG/KG
SB33C	SGA041	12/19/96 2:35 PM	LEAD	16.1	=	MG/KG
SB33C	SGA041	12/19/96 2:35 PM	METHYLENE CHLORIDE	0.002	J	MG/KG
SB33C	SGA041	12/19/96 2:35 PM	NICKEL	26.6	=	MG/KG
SB33C	SGA041	12/19/96 2:35 PM	ZINC	68.1	=	MG/KG
SS31A	SGA011	12/7/96 1:35 PM	BENZO(a)PYRENE	0.33	=	MG/KG
SS31A	SGA011	12/7/96 1:35 PM	CHROMIUM, TOTAL	530	=	MG/KG
SS31A	SGA011	12/7/96 1:35 PM	LEAD	664	=	MG/KG
SS31A	SGA011	12/7/96 1:35 PM	ARSENIC	10.7	=	MG/KG
SS31A	SGA011	12/7/96 1:35 PM	BENZO(a)ANTHRACENE	0.34	=	MG/KG
SS31A	SGA011	12/7/96 1:35 PM	BENZO(b)FLUORANTHENE	0.29	=	MG/KG

Table 1-1
Detected Concentrations at Surface Soil Sampling Locations in Parcels 35 and 28

StationID	SampleID	DateCollected	ParamName	AnaValue	ProjQual	Units
SS31A	SGA011	12/7/96 1:35 PM	BENZO(g,h,i)PERYLENE	0.25	=	MG/KG
SS31A	SGA011	12/7/96 1:35 PM	BENZO(k)FLUORANTHENE	0.26	=	MG/KG
SS31A	SGA011	12/7/96 1:35 PM	CADMIUM	8.1	=	MG/KG
SS31A	SGA011	12/7/96 1:35 PM	CHRYSENE	0.34	=	MG/KG
SS31A	SGA011	12/7/96 1:35 PM	COPPER	33.5	=	MG/KG
SS31A	SGA011	12/7/96 1:35 PM	FLUORANTHENE	0.52	=	MG/KG
SS31A	SGA011	12/7/96 1:35 PM	INDENO(1,2,3-c,d)PYRENE	0.21	=	MG/KG
SS31A	SGA011	12/7/96 1:35 PM	METHYLENE CHLORIDE	0.004	J	MG/KG
SS31A	SGA011	12/7/96 1:35 PM	NICKEL	26.4	=	MG/KG
SS31A	SGA011	12/7/96 1:35 PM	PHENANTHRENE	0.37	=	MG/KG
SS31A	SGA011	12/7/96 1:35 PM	PYRENE	0.43	=	MG/KG
SS31A	SGA011	12/7/96 1:35 PM	ZINC	1560	=	MG/KG
SS31B	SGA012	12/7/96 2:57 PM	ARSENIC	4.2	=	MG/KG
SS31B	SGA012	12/7/96 2:57 PM	BENZO(a)ANTHRACENE	0.067	=	MG/KG
SS31B	SGA012	12/7/96 2:57 PM	CADMIUM	1.7	=	MG/KG
SS31B	SGA012	12/7/96 2:57 PM	CHROMIUM, TOTAL	66.1	=	MG/KG
SS31B	SGA012	12/7/96 2:57 PM	CHRYSENE	0.058	=	MG/KG
SS31B	SGA012	12/7/96 2:57 PM	COPPER	11.6	=	MG/KG
SS31B	SGA012	12/7/96 2:57 PM	FLUORANTHENE	0.095	=	MG/KG
SS31B	SGA012	12/7/96 2:57 PM	LEAD	85.5	=	MG/KG
SS31B	SGA012	12/7/96 2:57 PM	METHYLENE CHLORIDE	0.002	J	MG/KG
SS31B	SGA012	12/7/96 2:57 PM	NICKEL	20	=	MG/KG
SS31B	SGA012	12/7/96 2:57 PM	PHENANTHRENE	0.071	=	MG/KG
SS31B	SGA012	12/7/96 2:57 PM	PYRENE	0.053	=	MG/KG
SS31B	SGA012	12/7/96 2:57 PM	ZINC	221	=	MG/KG
SS31C	SGA013	12/7/96 3:15 PM	ARSENIC	12.6	=	MG/KG
SS31C	SGA300FD1	12/7/96 3:15 PM	ARSENIC	16.2	=	MG/KG
SS31C	SGA300FD1	12/7/96 3:15 PM	BENZO(a)ANTHRACENE	0.068	=	MG/KG
SS31C	SGA300FD1	12/7/96 3:15 PM	BROMOMETHANE	0.002	J	MG/KG
SS31C	SGA013	12/7/96 3:15 PM	CHROMIUM, TOTAL	39.4	=	MG/KG
SS31C	SGA300FD1	12/7/96 3:15 PM	CHROMIUM, TOTAL	32.2	=	MG/KG
SS31C	SGA013	12/7/96 3:15 PM	COPPER	25.5	=	MG/KG
SS31C	SGA300FD1	12/7/96 3:15 PM	COPPER	33	=	MG/KG
SS31C	SGA300FD1	12/7/96 3:15 PM	FLUORANTHENE	0.082	=	MG/KG
SS31C	SGA013	12/7/96 3:15 PM	LEAD	84.6	=	MG/KG
SS31C	SGA300FD1	12/7/96 3:15 PM	LEAD	71.2	=	MG/KG
SS31C	SGA013	12/7/96 3:15 PM	METHYLENE CHLORIDE	0.004	J	MG/KG
SS31C	SGA300FD1	12/7/96 3:15 PM	METHYLENE CHLORIDE	0.007	J	MG/KG
SS31C	SGA013	12/7/96 3:15 PM	NICKEL	27	=	MG/KG
SS31C	SGA300FD1	12/7/96 3:15 PM	NICKEL	36.9	=	MG/KG
SS31C	SGA013	12/7/96 3:15 PM	ZINC	275	=	MG/KG
SS31C	SGA300FD1	12/7/96 3:15 PM	ZINC	168	=	MG/KG
SS31D	SGB058	12/7/96 1:53 PM	CALCIUM	7100	=	MG/KG
SS31D	SGB058	12/7/96 1:53 PM	2-METHYLNAPHTHALENE	0.084	J	MG/KG
SS31D	SGB058	12/7/96 1:53 PM	ALUMINUM	6600	=	MG/KG
SS31D	SGB058	12/7/96 1:53 PM	ARSENIC	6.2	J	MG/KG
SS31D	SGB058	12/7/96 1:53 PM	BARIUM	109	=	MG/KG
SS31D	SGB058	12/7/96 1:53 PM	BENZO(a)ANTHRACENE	0.084	J	MG/KG
SS31D	SGB058	12/7/96 1:53 PM	BENZO(a)PYRENE	0.079	J	MG/KG

Table 1-1
Detected Concentrations at Surface Soil Sampling Locations in Parcels 35 and 28

StationID	SampleID	DateCollected	ParamName	AnaValue	ProjQual	Units
SS31D	SGB058	12/7/96 1:53 PM	BENZO(b)FLUORANTHENE	0.1	J	MG/KG
SS31D	SGB058	12/7/96 1:53 PM	BENZO(k)FLUORANTHENE	0.049	J	MG/KG
SS31D	SGB058	12/7/96 1:53 PM	BERYLLIUM	0.72	=	MG/KG
SS31D	SGB058	12/7/96 1:53 PM	CADMIUM	0.51	J	MG/KG
SS31D	SGB058	12/7/96 1:53 PM	CHROMIUM, TOTAL	37.4	J	MG/KG
SS31D	SGB058	12/7/96 1:53 PM	CHRYSENE	0.13	J	MG/KG
SS31D	SGB058	12/7/96 1:53 PM	COBALT	6.8	=	MG/KG
SS31D	SGB058	12/7/96 1:53 PM	COPPER	24.3	=	MG/KG
SS31D	SGB058	12/7/96 1:53 PM	FLUORANTHENE	0.16	J	MG/KG
SS31D	SGB058	12/7/96 1:53 PM	INDENO(1,2,3-c,d)PYRENE	0.054	J	MG/KG
SS31D	SGB058	12/7/96 1:53 PM	IRON	14900	=	MG/KG
SS31D	SGB058	12/7/96 1:53 PM	LEAD	205	=	MG/KG
SS31D	SGB058	12/7/96 1:53 PM	MAGNESIUM	885	=	MG/KG
SS31D	SGB058	12/7/96 1:53 PM	MANGANESE	410	=	MG/KG
SS31D	SGB058	12/7/96 1:53 PM	NAPHTHALENE	0.1	J	MG/KG
SS31D	SGB058	12/7/96 1:53 PM	NICKEL	16.3	=	MG/KG
SS31D	SGB058	12/7/96 1:53 PM	PHENANTHRENE	0.23	J	MG/KG
SS31D	SGB058	12/7/96 1:53 PM	POTASSIUM	651	=	MG/KG
SS31D	SGB058	12/7/96 1:53 PM	PYRENE	0.19	J	MG/KG
SS31D	SGB058	12/7/96 1:53 PM	SILVER	0.31	J	MG/KG
SS31D	SGB058	12/7/96 1:53 PM	SODIUM	336	J	MG/KG
SS31D	SGB058	12/7/96 1:53 PM	VANADIUM	17.6	J	MG/KG
SS31D	SGB058	12/7/96 1:53 PM	ZINC	99.2	=	MG/KG
SS32B	RHA015	1/18/97 2:55 PM	BENZO(a)PYRENE	0.61	=	MG/KG
SS32B	RHA015	1/18/97 2:55 PM	LEAD	678	=	MG/KG
SS32B	RHA015	1/18/97 2:55 PM	ACENAPHTHYLENE	0.14	=	MG/KG
SS32B	RHA015	1/18/97 2:55 PM	ARSENIC	14.9	=	MG/KG
SS32B	RHA015	1/18/97 2:55 PM	BENZO(a)ANTHRACENE	0.73	=	MG/KG
SS32B	RHA015	1/18/97 2:55 PM	BENZO(b)FLUORANTHENE	0.73	=	MG/KG
SS32B	RHA015	1/18/97 2:55 PM	BENZO(g,h,i)PERYLENE	0.57	=	MG/KG
SS32B	RHA015	1/18/97 2:55 PM	BENZO(k)FLUORANTHENE	0.72	=	MG/KG
SS32B	RHA015	1/18/97 2:55 PM	CADMIUM	1.9	=	MG/KG
SS32B	RHA015	1/18/97 2:55 PM	CHROMIUM, TOTAL	138	=	MG/KG
SS32B	RHA015	1/18/97 2:55 PM	CHRYSENE	0.8	=	MG/KG
SS32B	RHA015	1/18/97 2:55 PM	COPPER	86	=	MG/KG
SS32B	RHA015	1/18/97 2:55 PM	FLUORANTHENE	1.2	=	MG/KG
SS32B	RHA015	1/18/97 2:55 PM	INDENO(1,2,3-c,d)PYRENE	0.46	=	MG/KG
SS32B	RHA015	1/18/97 2:55 PM	NICKEL	38.7	=	MG/KG
SS32B	RHA015	1/18/97 2:55 PM	PHENANTHRENE	0.32	=	MG/KG
SS32B	RHA015	1/18/97 2:55 PM	PYRENE	1.1	=	MG/KG
SS32B	RHA015	1/18/97 2:55 PM	ZINC	519	=	MG/KG
SS32C	RHA016	1/18/97 3:10 PM	CHROMIUM, TOTAL	275	=	MG/KG
SS32C	RHA016	1/18/97 3:10 PM	LEAD	693	=	MG/KG
SS32C	RHA016	1/18/97 3:10 PM	ARSENIC	11	=	MG/KG
SS32C	RHA016	1/18/97 3:10 PM	BENZO(a)ANTHRACENE	0.073	=	MG/KG
SS32C	RHA016	1/18/97 3:10 PM	BENZO(a)PYRENE	0.07	=	MG/KG
SS32C	RHA016	1/18/97 3:10 PM	BENZO(b)FLUORANTHENE	0.057	=	MG/KG
SS32C	RHA016	1/18/97 3:10 PM	BENZO(k)FLUORANTHENE	0.057	=	MG/KG
SS32C	RHA016	1/18/97 3:10 PM	COPPER	49.8	=	MG/KG

Table 1-1
Detected Concentrations at Surface Soil Sampling Locations in Parcels 35 and 28

StationID	SampleID	DateCollected	ParamName	AnaValue	ProjQual	Units
SS32C	RHA016	1/18/97 3:10 PM	FLUORANTHENE	0.11	=	MG/KG
SS32C	RHA016	1/18/97 3:10 PM	NICKEL	27.2	=	MG/KG
SS32C	RHA016	1/18/97 3:10 PM	PHENANTHRENE	0.093	=	MG/KG
SS32C	RHA016	1/18/97 3:10 PM	PYRENE	0.087	=	MG/KG
SS32C	RHA016	1/18/97 3:10 PM	ZINC	507	=	MG/KG
SS32D	RHA017	1/18/97 3:30 PM	BENZO(a)PYRENE	0.13	=	MG/KG
SS32D	RHA017	1/18/97 3:30 PM	LEAD	766	=	MG/KG
SS32D	RHA017	1/18/97 3:30 PM	ARSENIC	14.6	=	MG/KG
SS32D	RHA017	1/18/97 3:30 PM	BENZO(a)ANTHRACENE	0.12	=	MG/KG
SS32D	RHA017	1/18/97 3:30 PM	BENZO(b)FLUORANTHENE	0.1	=	MG/KG
SS32D	RHA017	1/18/97 3:30 PM	BENZO(g,h,i)PERYLENE	0.089	=	MG/KG
SS32D	RHA017	1/18/97 3:30 PM	BENZO(k)FLUORANTHENE	0.11	=	MG/KG
SS32D	RHA017	1/18/97 3:30 PM	CHROMIUM, TOTAL	207	=	MG/KG
SS32D	RHA017	1/18/97 3:30 PM	CHRYSENE	0.12	=	MG/KG
SS32D	RHA017	1/18/97 3:30 PM	COPPER	103	=	MG/KG
SS32D	RHA017	1/18/97 3:30 PM	FLUORANTHENE	0.23	=	MG/KG
SS32D	RHA017	1/18/97 3:30 PM	INDENO(1,2,3-c,d)PYRENE	0.11	=	MG/KG
SS32D	RHA017	1/18/97 3:30 PM	NICKEL	30.3	=	MG/KG
SS32D	RHA017	1/18/97 3:30 PM	PHENANTHRENE	0.16	=	MG/KG
SS32D	RHA017	1/18/97 3:30 PM	PYRENE	0.16	=	MG/KG
SS32D	RHA017	1/18/97 3:30 PM	ZINC	416	=	MG/KG
SS32E	RHA018	1/18/97 4:45 PM	BENZO(a)PYRENE	0.38	J	MG/KG
SS32E	RHA018	1/18/97 4:45 PM	CALCIUM	11100	=	MG/KG
SS32E	RHA018	1/18/97 4:45 PM	PHENANTHRENE	0.88	=	MG/KG
SS32E	RHA018	1/18/97 4:45 PM	ACENAPHTHENE	0.089	J	MG/KG
SS32E	RHA018	1/18/97 4:45 PM	ALUMINUM	6390	=	MG/KG
SS32E	RHA018	1/18/97 4:45 PM	ANTHRACENE	0.2	J	MG/KG
SS32E	RHA018	1/18/97 4:45 PM	ARSENIC	7.7	=	MG/KG
SS32E	RHA018	1/18/97 4:45 PM	BARIUM	128	=	MG/KG
SS32E	RHA018	1/18/97 4:45 PM	BENZO(a)ANTHRACENE	0.5	=	MG/KG
SS32E	RHA018	1/18/97 4:45 PM	BENZO(b)FLUORANTHENE	0.39	J	MG/KG
SS32E	RHA018	1/18/97 4:45 PM	BENZO(g,h,i)PERYLENE	0.24	J	MG/KG
SS32E	RHA018	1/18/97 4:45 PM	BENZO(k)FLUORANTHENE	0.39	J	MG/KG
SS32E	RHA018	1/18/97 4:45 PM	CADMIUM	0.43	J	MG/KG
SS32E	RHA018	1/18/97 4:45 PM	CARBAZOLE	0.16	J	MG/KG
SS32E	RHA018	1/18/97 4:45 PM	CHROMIUM, TOTAL	26.6	=	MG/KG
SS32E	RHA018	1/18/97 4:45 PM	CHRYSENE	0.5	=	MG/KG
SS32E	RHA018	1/18/97 4:45 PM	COBALT	5.7	J	MG/KG
SS32E	RHA018	1/18/97 4:45 PM	COPPER	20.3	J	MG/KG
SS32E	RHA018	1/18/97 4:45 PM	FLUORANTHENE	1.3	=	MG/KG
SS32E	RHA018	1/18/97 4:45 PM	FLUORENE	0.086	J	MG/KG
SS32E	RHA018	1/18/97 4:45 PM	INDENO(1,2,3-c,d)PYRENE	0.24	J	MG/KG
SS32E	RHA018	1/18/97 4:45 PM	IRON	12800	=	MG/KG
SS32E	RHA018	1/18/97 4:45 PM	LEAD	119	=	MG/KG
SS32E	RHA018	1/18/97 4:45 PM	MAGNESIUM	1530	=	MG/KG
SS32E	RHA018	1/18/97 4:45 PM	MANGANESE	475	=	MG/KG
SS32E	RHA018	1/18/97 4:45 PM	NICKEL	10.8	=	MG/KG
SS32E	RHA018	1/18/97 4:45 PM	POTASSIUM	1230	=	MG/KG
SS32E	RHA018	1/18/97 4:45 PM	PYRENE	0.89	=	MG/KG

Table 1-1
Detected Concentrations at Surface Soil Sampling Locations in Parcels 35 and 28

StationID	SampleID	DateCollected	ParamName	AnaValue	ProjQual	Units
SS32E	RHA018	1/18/97 4:45 PM	VANADIUM	17.9	=	MG/KG
SS32E	RHA018	1/18/97 4:45 PM	ZINC	72.1	=	MG/KG
SS32F	RHA019	1/18/97 5:00 PM	BENZO(a)PYRENE	0.15	=	MG/KG
SS32F	RHA019	1/18/97 5:00 PM	ARSENIC	8.2	=	MG/KG
SS32F	RHA019	1/18/97 5:00 PM	BENZO(a)ANTHRACENE	0.14	=	MG/KG
SS32F	RHA019	1/18/97 5:00 PM	BENZO(b)FLUORANTHENE	0.14	=	MG/KG
SS32F	RHA019	1/18/97 5:00 PM	BENZO(g,h,i)PERYLENE	0.13	=	MG/KG
SS32F	RHA019	1/18/97 5:00 PM	BENZO(k)FLUORANTHENE	0.18	=	MG/KG
SS32F	RHA019	1/18/97 5:00 PM	CADMIUM	2.5	=	MG/KG
SS32F	RHA019	1/18/97 5:00 PM	CHROMIUM, TOTAL	45.2	=	MG/KG
SS32F	RHA019	1/18/97 5:00 PM	CHRYSENE	0.15	=	MG/KG
SS32F	RHA019	1/18/97 5:00 PM	COPPER	24	=	MG/KG
SS32F	RHA019	1/18/97 5:00 PM	FLUORANTHENE	0.29	=	MG/KG
SS32F	RHA019	1/18/97 5:00 PM	INDENO(1,2,3-c,d)PYRENE	0.14	=	MG/KG
SS32F	RHA019	1/18/97 5:00 PM	LEAD	105	=	MG/KG
SS32F	RHA019	1/18/97 5:00 PM	NICKEL	18.2	=	MG/KG
SS32F	RHA019	1/18/97 5:00 PM	PHENANTHRENE	0.17	=	MG/KG
SS32F	RHA019	1/18/97 5:00 PM	PYRENE	0.24	=	MG/KG
SS32F	RHA019	1/18/97 5:00 PM	ZINC	4000	=	MG/KG
SS32G	RHA021FD1	1/18/97 4:30 PM	BENZO(a)PYRENE	0.12	=	MG/KG
SS32G	RHA020	1/18/97 4:30 PM	CHROMIUM, TOTAL	336	=	MG/KG
SS32G	RHA020	1/18/97 4:30 PM	LEAD	1580	=	MG/KG
SS32G	RHA021FD1	1/18/97 4:30 PM	LEAD	563	=	MG/KG
SS32G	RHA020	1/18/97 4:30 PM	ANTIMONY	7	=	MG/KG
SS32G	RHA020	1/18/97 4:30 PM	ARSENIC	17.1	=	MG/KG
SS32G	RHA021FD1	1/18/97 4:30 PM	ARSENIC	15.6	=	MG/KG
SS32G	RHA021FD1	1/18/97 4:30 PM	BENZO(a)ANTHRACENE	0.13	=	MG/KG
SS32G	RHA021FD1	1/18/97 4:30 PM	BENZO(b)FLUORANTHENE	0.12	=	MG/KG
SS32G	RHA020	1/18/97 4:30 PM	BENZO(g,h,i)PERYLENE	0.073	=	MG/KG
SS32G	RHA021FD1	1/18/97 4:30 PM	BENZO(g,h,i)PERYLENE	0.1	=	MG/KG
SS32G	RHA021FD1	1/18/97 4:30 PM	BENZO(k)FLUORANTHENE	0.11	=	MG/KG
SS32G	RHA020	1/18/97 4:30 PM	CADMIUM	2	=	MG/KG
SS32G	RHA021FD1	1/18/97 4:30 PM	CADMIUM	1.3	=	MG/KG
SS32G	RHA021FD1	1/18/97 4:30 PM	CHROMIUM, TOTAL	164	=	MG/KG
SS32G	RHA021FD1	1/18/97 4:30 PM	CHRYSENE	0.11	=	MG/KG
SS32G	RHA020	1/18/97 4:30 PM	COPPER	48.9	=	MG/KG
SS32G	RHA021FD1	1/18/97 4:30 PM	COPPER	67.9	=	MG/KG
SS32G	RHA020	1/18/97 4:30 PM	FLUORANTHENE	0.1	=	MG/KG
SS32G	RHA021FD1	1/18/97 4:30 PM	FLUORANTHENE	0.24	=	MG/KG
SS32G	RHA020	1/18/97 4:30 PM	INDENO(1,2,3-c,d)PYRENE	0.088	=	MG/KG
SS32G	RHA021FD1	1/18/97 4:30 PM	INDENO(1,2,3-c,d)PYRENE	0.12	=	MG/KG
SS32G	RHA020	1/18/97 4:30 PM	NICKEL	16.4	=	MG/KG
SS32G	RHA021FD1	1/18/97 4:30 PM	NICKEL	32	=	MG/KG
SS32G	RHA020	1/18/97 4:30 PM	PHENANTHRENE	0.089	=	MG/KG
SS32G	RHA021FD1	1/18/97 4:30 PM	PHENANTHRENE	0.16	=	MG/KG
SS32G	RHA020	1/18/97 4:30 PM	PYRENE	0.076	=	MG/KG
SS32G	RHA021FD1	1/18/97 4:30 PM	PYRENE	0.17	=	MG/KG
SS32G	RHA020	1/18/97 4:30 PM	ZINC	693	=	MG/KG
SS32G	RHA021FD1	1/18/97 4:30 PM	ZINC	369	=	MG/KG

Table 1-1
Detected Concentrations at Surface Soil Sampling Locations in Parcels 35 and 28

StationID	SampleID	DateCollected	ParamName	AnaValue	ProjQual	Units
SS33A	SGA025	12/8/96 7:58 AM	ACETONE	0.005	J	MG/KG
SS33A	SGA025	12/8/96 7:58 AM	ARSENIC	8.1	=	MG/KG
SS33A	SGA025	12/8/96 7:58 AM	CHROMIUM, TOTAL	44.9	=	MG/KG
SS33A	SGA025	12/8/96 7:58 AM	COPPER	39.8	=	MG/KG
SS33A	SGA025	12/8/96 7:58 AM	LEAD	129	=	MG/KG
SS33A	SGA025	12/8/96 7:58 AM	NICKEL	16.7	=	MG/KG
SS33A	SGA025	12/8/96 7:58 AM	ZINC	91.6	=	MG/KG
SS33C	SGA027	12/8/96 8:50 AM	ARSENIC	11.8	=	MG/KG
SS33C	SGA027	12/8/96 8:50 AM	CHROMIUM, TOTAL	53.8	=	MG/KG
SS33C	SGA027	12/8/96 8:50 AM	COPPER	62.8	=	MG/KG
SS33C	SGA027	12/8/96 8:50 AM	LEAD	200	=	MG/KG
SS33C	SGA027	12/8/96 8:50 AM	NICKEL	29.1	=	MG/KG
SS33C	SGA027	12/8/96 8:50 AM	ZINC	187	=	MG/KG
SS33D	SGA028	12/8/96 10:15 AM	LEAD	751	=	MG/KG
SS33D	SGA028	12/8/96 10:15 AM	ACETONE	0.004	J	MG/KG
SS33D	SGA028	12/8/96 10:15 AM	ARSENIC	19.6	=	MG/KG
SS33D	SGA028	12/8/96 10:15 AM	CADMIUM	2	=	MG/KG
SS33D	SGA028	12/8/96 10:15 AM	CHROMIUM, TOTAL	158	=	MG/KG
SS33D	SGA028	12/8/96 10:15 AM	COPPER	41.5	=	MG/KG
SS33D	SGA028	12/8/96 10:15 AM	NICKEL	27.6	=	MG/KG
SS33D	SGA028	12/8/96 10:15 AM	ZINC	1090	=	MG/KG
SS33E	SGB068	12/8/96 9:30 AM	BENZO(a)PYRENE	0.13	J	MG/KG
SS33E	SGB068	12/8/96 9:30 AM	CALCIUM	7360	=	MG/KG
SS33E	SGB068	12/8/96 9:30 AM	ALUMINUM	7410	=	MG/KG
SS33E	SGB068	12/8/96 9:30 AM	ANTIMONY	2	J	MG/KG
SS33E	SGB068	12/8/96 9:30 AM	ARSENIC	13.8	J	MG/KG
SS33E	SGB068	12/8/96 9:30 AM	BARIUM	432	=	MG/KG
SS33E	SGB068	12/8/96 9:30 AM	BENZO(a)ANTHRACENE	0.11	J	MG/KG
SS33E	SGB068	12/8/96 9:30 AM	BENZO(b)FLUORANTHENE	0.14	J	MG/KG
SS33E	SGB068	12/8/96 9:30 AM	BENZO(g,h,i)PERYLENE	0.082	J	MG/KG
SS33E	SGB068	12/8/96 9:30 AM	BENZO(k)FLUORANTHENE	0.14	J	MG/KG
SS33E	SGB068	12/8/96 9:30 AM	BERYLLIUM	0.45	J	MG/KG
SS33E	SGB068	12/8/96 9:30 AM	bis(2-ETHYLHEXYL)	0.041	J	MG/KG
SS33E	SGB068	12/8/96 9:30 AM	CHROMIUM, TOTAL	22.5	J	MG/KG
SS33E	SGB068	12/8/96 9:30 AM	CHRYSENE	0.16	J	MG/KG
SS33E	SGB068	12/8/96 9:30 AM	COBALT	3.8	J	MG/KG
SS33E	SGB068	12/8/96 9:30 AM	COPPER	14.7	=	MG/KG
SS33E	SGB068	12/8/96 9:30 AM	FLUORANTHENE	0.21	J	MG/KG
SS33E	SGB068	12/8/96 9:30 AM	INDENO(1,2,3-c,d)PYRENE	0.064	J	MG/KG
SS33E	SGB068	12/8/96 9:30 AM	IRON	9280	=	MG/KG
SS33E	SGB068	12/8/96 9:30 AM	LEAD	140	=	MG/KG
SS33E	SGB068	12/8/96 9:30 AM	MAGNESIUM	1380	=	MG/KG
SS33E	SGB068	12/8/96 9:30 AM	MANGANESE	291	=	MG/KG
SS33E	SGB068	12/8/96 9:30 AM	NICKEL	7.5	=	MG/KG
SS33E	SGB068	12/8/96 9:30 AM	PHENANTHRENE	0.15	J	MG/KG
SS33E	SGB068	12/8/96 9:30 AM	POTASSIUM	582	J	MG/KG
SS33E	SGB068	12/8/96 9:30 AM	PYRENE	0.32	J	MG/KG
SS33E	SGB068	12/8/96 9:30 AM	SODIUM	261	J	MG/KG
SS33E	SGB068	12/8/96 9:30 AM	VANADIUM	15.1	J	MG/KG

Table 1-1
Detected Concentrations at Surface Soil Sampling Locations in Parcels 35 and 28

StationID	SampleID	DateCollected	ParamName	AnaValue	ProjQual	Units
SS33E	SGB068	12/8/96 9:30 AM	ZINC	551	=	MG/KG
SS33F	SGA030	12/8/96 9:20 AM	ACETONE	0.004	J	MG/KG
SS33F	SGA030	12/8/96 9:20 AM	ARSENIC	18.4	=	MG/KG
SS33F	SGA030	12/8/96 9:20 AM	CHROMIUM, TOTAL	40.8	=	MG/KG
SS33F	SGA030	12/8/96 9:20 AM	COPPER	30.7	=	MG/KG
SS33F	SGA030	12/8/96 9:20 AM	LEAD	79.3	=	MG/KG
SS33F	SGA030	12/8/96 9:20 AM	NICKEL	26.5	=	MG/KG
SS33F	SGA030	12/8/96 9:20 AM	ZINC	211	=	MG/KG
SS33G	MIA333	10/8/98 11:45 AM	ANTIMONY	0.24	J	MG/KG
SS33G	MIA333	10/8/98 11:45 AM	ARSENIC	8.2	=	MG/KG
SS33G	MIA333	10/8/98 11:45 AM	BERYLLIUM	0.44	J	MG/KG
SS33G	MIA333	10/8/98 11:45 AM	CADMIUM	0.19	J	MG/KG
SS33G	MIA333	10/8/98 11:45 AM	CHROMIUM III	17.2	=	MG/KG
SS33G	MIA333	10/8/98 11:45 AM	CHROMIUM, TOTAL	17.1	=	MG/KG
SS33G	MIA333	10/8/98 11:45 AM	COPPER	16.1	=	MG/KG
SS33G	MIA333	10/8/98 11:45 AM	LEAD	34.6	=	MG/KG
SS33G	MIA333	10/8/98 11:45 AM	MERCURY	0.02	J	MG/KG
SS33G	MIA333	10/8/98 11:45 AM	NICKEL	14.6	J	MG/KG
SS33G	MIA333	10/8/98 11:45 AM	p,p'-DDE	0.0019	J	MG/KG
SS33G	MIA333	10/8/98 11:45 AM	p,p'-DDT	0.0056	=	MG/KG
SS33G	MIA333	10/8/98 11:45 AM	SELENIUM	0.89	=	MG/KG
SS33G	MIA333	10/8/98 11:45 AM	ZINC	57.8	J	MG/KG
SS33H	MIA334	10/8/98 12:00 PM	CHROMIUM, TOTAL	265	=	MG/KG
SS33H	MIA334	10/8/98 12:00 PM	LEAD	900	=	MG/KG
SS33H	MIA334	10/8/98 12:00 PM	ARSENIC	7.2	=	MG/KG
SS33H	MIA334	10/8/98 12:00 PM	BERYLLIUM	0.42	J	MG/KG
SS33H	MIA334	10/8/98 12:00 PM	CADMIUM	1	J	MG/KG
SS33H	MIA334	10/8/98 12:00 PM	COPPER	35.5	=	MG/KG
SS33H	MIA334	10/8/98 12:00 PM	MERCURY	0.05	=	MG/KG
SS33H	MIA334	10/8/98 12:00 PM	NICKEL	11	J	MG/KG
SS33H	MIA334	10/8/98 12:00 PM	p,p'-DDE	0.17	J	MG/KG
SS33H	MIA334	10/8/98 12:00 PM	p,p'-DDT	0.41	=	MG/KG
SS33H	MIA334	10/8/98 12:00 PM	SELENIUM	0.54	J	MG/KG
SS33H	MIA334	10/8/98 12:00 PM	ZINC	653	J	MG/KG
SS33I	MIA335	10/8/98 3:55 PM	ARSENIC	12.1	=	MG/KG
SS33I	MIA335	10/8/98 3:55 PM	BERYLLIUM	0.42	J	MG/KG
SS33I	MIA335	10/8/98 3:55 PM	CADMIUM	0.24	J	MG/KG
SS33I	MIA335	10/8/98 3:55 PM	CHROMIUM III	13.1	=	MG/KG
SS33I	MIA335	10/8/98 3:55 PM	CHROMIUM, TOTAL	13	=	MG/KG
SS33I	MIA335	10/8/98 3:55 PM	COPPER	13.4	=	MG/KG
SS33I	MIA335	10/8/98 3:55 PM	DIELDRIN	0.0064	=	MG/KG
SS33I	MIA335	10/8/98 3:55 PM	LEAD	22.8	=	MG/KG
SS33I	MIA335	10/8/98 3:55 PM	MERCURY	0.03	J	MG/KG
SS33I	MIA335	10/8/98 3:55 PM	NICKEL	14.1	J	MG/KG
SS33I	MIA335	10/8/98 3:55 PM	SELENIUM	1.6	=	MG/KG
SS33I	MIA335	10/8/98 3:55 PM	ZINC	37.4	J	MG/KG
SS33J	MIA336	10/8/98 4:10 PM	ANTIMONY	0.24	J	MG/KG
SS33J	MIA336	10/8/98 4:10 PM	ARSENIC	9.3	=	MG/KG
SS33J	MIA336	10/8/98 4:10 PM	BERYLLIUM	0.43	J	MG/KG

Table 1-1
Detected Concentrations at Surface Soil Sampling Locations in Parcels 35 and 28

StationID	SampleID	DateCollected	ParamName	AnaValue	ProjQual	Units
SS33J	MIA336	10/8/98 4:10 PM	CADMIUM	0.16	J	MG/KG
SS33J	MIA336	10/8/98 4:10 PM	CHROMIUM, TOTAL	11	=	MG/KG
SS33J	MIA336	10/8/98 4:10 PM	COPPER	11.2	=	MG/KG
SS33J	MIA336	10/8/98 4:10 PM	DIELDRIN	0.0012	J	MG/KG
SS33J	MIA336	10/8/98 4:10 PM	LEAD	10	=	MG/KG
SS33J	MIA336	10/8/98 4:10 PM	NICKEL	11.7	J	MG/KG
SS33J	MIA336	10/8/98 4:10 PM	p,p'-DDE	0.0014	J	MG/KG
SS33J	MIA336	10/8/98 4:10 PM	p,p'-DDT	0.0027	J	MG/KG
SS33J	MIA336	10/8/98 4:10 PM	SELENIUM	1.6	=	MG/KG
SS33J	MIA336	10/8/98 4:10 PM	ZINC	30.7	J	MG/KG
SS33K	MIA325	10/8/98 4:30 PM	ANTIMONY	10.1	J	MG/KG
SS33K	MIA325	10/8/98 4:30 PM	ARSENIC	22	=	MG/KG
SS33K	MIA325	10/8/98 4:30 PM	CHROMIUM, TOTAL	403	=	MG/KG
SS33K	MIA325	10/8/98 4:30 PM	LEAD	1830	=	MG/KG
SS33K	MIA325	10/8/98 4:30 PM	BERYLLIUM	0.34	J	MG/KG
SS33K	MIA325	10/8/98 4:30 PM	CADMIUM	2.7	J	MG/KG
SS33K	MIA325	10/8/98 4:30 PM	CHROMIUM III	403	=	MG/KG
SS33K	MIA325	10/8/98 4:30 PM	CHROMIUM, HEXAVALENT	0.12	=	MG/KG
SS33K	MIA325	10/8/98 4:30 PM	COPPER	163	J	MG/KG
SS33K	MIA325	10/8/98 4:30 PM	DIELDRIN	0.035	J	MG/KG
SS33K	MIA325	10/8/98 4:30 PM	MERCURY	0.07	=	MG/KG
SS33K	MIA325	10/8/98 4:30 PM	NICKEL	56	J	MG/KG
SS33K	MIA325	10/8/98 4:30 PM	p,p'-DDE	0.098	=	MG/KG
SS33K	MIA325	10/8/98 4:30 PM	p,p'-DDT	0.28	=	MG/KG
SS33K	MIA325	10/8/98 4:30 PM	SELENIUM	1.6	J	MG/KG
SS33K	MIA325	10/8/98 4:30 PM	SILVER	1.6	J	MG/KG
SS33K	MIA325	10/8/98 4:30 PM	ZINC	856	J	MG/KG
SS33L	MIA326	10/8/98 4:40 PM	ARSENIC	6	=	MG/KG
SS33L	MIA326	10/8/98 4:40 PM	BERYLLIUM	0.37	J	MG/KG
SS33L	MIA326	10/8/98 4:40 PM	CADMIUM	0.29	J	MG/KG
SS33L	MIA326	10/8/98 4:40 PM	CHROMIUM, TOTAL	47.9	=	MG/KG
SS33L	MIA326	10/8/98 4:40 PM	COPPER	23.6	J	MG/KG
SS33L	MIA326	10/8/98 4:40 PM	LEAD	114	=	MG/KG
SS33L	MIA326	10/8/98 4:40 PM	NICKEL	11.3	J	MG/KG
SS33L	MIA326	10/8/98 4:40 PM	p,p'-DDE	0.0044	J	MG/KG
SS33L	MIA326	10/8/98 4:40 PM	p,p'-DDT	0.013	=	MG/KG
SS33L	MIA326	10/8/98 4:40 PM	SELENIUM	0.91	=	MG/KG
SS33L	MIA326	10/8/98 4:40 PM	ZINC	78	J	MG/KG
SS33M	MIA327	10/8/98 2:30 PM	CALCIUM	46100	=	MG/KG
SS33M	MIA328FD	10/8/98 2:30 PM	CALCIUM	37400	=	MG/KG
SS33M	MIA327	10/8/98 2:30 PM	2-HEXANONE	0.001	J	MG/KG
SS33M	MIA328FD	10/8/98 2:30 PM	2-HEXANONE	0.001	J	MG/KG
SS33M	MIA327	10/8/98 2:30 PM	ALUMINUM	4740	=	MG/KG
SS33M	MIA328FD	10/8/98 2:30 PM	ALUMINUM	5700	=	MG/KG
SS33M	MIA327	10/8/98 2:30 PM	ARSENIC	5.5	=	MG/KG
SS33M	MIA328FD	10/8/98 2:30 PM	ARSENIC	7.2	=	MG/KG
SS33M	MIA327	10/8/98 2:30 PM	BARIUM	76.2	=	MG/KG
SS33M	MIA328FD	10/8/98 2:30 PM	BARIUM	88.6	=	MG/KG
SS33M	MIA327	10/8/98 2:30 PM	BENZENE	0.002	J	MG/KG

Table 1-1
Detected Concentrations at Surface Soil Sampling Locations in Parcels 35 and 28

StationID	SampleID	DateCollected	ParamName	AnaValue	ProjQual	Units
SS33M	MIA328FD	10/8/98 2:30 PM	BENZENE	0.007	J	MG/KG
SS33M	MIA327	10/8/98 2:30 PM	BERYLLIUM	0.37	J	MG/KG
SS33M	MIA328FD	10/8/98 2:30 PM	BERYLLIUM	0.38	J	MG/KG
SS33M	MIA327	10/8/98 2:30 PM	CADMIUM	0.51	J	MG/KG
SS33M	MIA328FD	10/8/98 2:30 PM	CADMIUM	1.5	J	MG/KG
SS33M	MIA327	10/8/98 2:30 PM	CARBON DISULFIDE	0.002	J	MG/KG
SS33M	MIA328FD	10/8/98 2:30 PM	CARBON DISULFIDE	0.002	J	MG/KG
SS33M	MIA327	10/8/98 2:30 PM	CHROMIUM III	133	=	MG/KG
SS33M	MIA328FD	10/8/98 2:30 PM	CHROMIUM III	143	=	MG/KG
SS33M	MIA327	10/8/98 2:30 PM	CHROMIUM, TOTAL	133	=	MG/KG
SS33M	MIA328FD	10/8/98 2:30 PM	CHROMIUM, TOTAL	143	=	MG/KG
SS33M	MIA327	10/8/98 2:30 PM	COBALT	4.7	J	MG/KG
SS33M	MIA328FD	10/8/98 2:30 PM	COBALT	5	J	MG/KG
SS33M	MIA328FD	10/8/98 2:30 PM	COPPER	60	=	MG/KG
SS33M	MIA327	10/8/98 2:30 PM	COPPER	38.9	J	MG/KG
SS33M	MIA327	10/8/98 2:30 PM	DIELDRIN	0.012	J	MG/KG
SS33M	MIA328FD	10/8/98 2:30 PM	DIELDRIN	0.014	J	MG/KG
SS33M	MIA327	10/8/98 2:30 PM	IRON	19900	=	MG/KG
SS33M	MIA328FD	10/8/98 2:30 PM	IRON	24800	=	MG/KG
SS33M	MIA327	10/8/98 2:30 PM	LEAD	332	=	MG/KG
SS33M	MIA328FD	10/8/98 2:30 PM	LEAD	373	=	MG/KG
SS33M	MIA327	10/8/98 2:30 PM	MAGNESIUM	3050	=	MG/KG
SS33M	MIA328FD	10/8/98 2:30 PM	MAGNESIUM	2890	=	MG/KG
SS33M	MIA327	10/8/98 2:30 PM	MANGANESE	311	=	MG/KG
SS33M	MIA328FD	10/8/98 2:30 PM	MANGANESE	315	=	MG/KG
SS33M	MIA328FD	10/8/98 2:30 PM	MERCURY	0.04	=	MG/KG
SS33M	MIA327	10/8/98 2:30 PM	METHYL ETHYL KETONE (2-	0.008	J	MG/KG
SS33M	MIA328FD	10/8/98 2:30 PM	METHYL ETHYL KETONE (2-	0.009	J	MG/KG
SS33M	MIA327	10/8/98 2:30 PM	NICKEL	16.2	J	MG/KG
SS33M	MIA328FD	10/8/98 2:30 PM	NICKEL	19	J	MG/KG
SS33M	MIA327	10/8/98 2:30 PM	p,p'-DDD	0.032	J	MG/KG
SS33M	MIA328FD	10/8/98 2:30 PM	p,p'-DDD	0.029	J	MG/KG
SS33M	MIA327	10/8/98 2:30 PM	p,p'-DDE	0.048	=	MG/KG
SS33M	MIA328FD	10/8/98 2:30 PM	p,p'-DDE	0.058	=	MG/KG
SS33M	MIA327	10/8/98 2:30 PM	p,p'-DDT	0.12	=	MG/KG
SS33M	MIA328FD	10/8/98 2:30 PM	p,p'-DDT	0.14	=	MG/KG
SS33M	MIA327	10/8/98 2:30 PM	POTASSIUM	1050	=	MG/KG
SS33M	MIA328FD	10/8/98 2:30 PM	POTASSIUM	1290	=	MG/KG
SS33M	MIA327	10/8/98 2:30 PM	SODIUM	62.1	J	MG/KG
SS33M	MIA327	10/8/98 2:30 PM	TOLUENE	0.001	J	MG/KG
SS33M	MIA328FD	10/8/98 2:30 PM	TOLUENE	0.004	J	MG/KG
SS33M	MIA327	10/8/98 2:30 PM	Total Xylenes	0.001	J	MG/KG
SS33M	MIA328FD	10/8/98 2:30 PM	Total Xylenes	0.003	J	MG/KG
SS33M	MIA327	10/8/98 2:30 PM	VANADIUM	12	=	MG/KG
SS33M	MIA328FD	10/8/98 2:30 PM	VANADIUM	15.9	=	MG/KG
SS33M	MIA327	10/8/98 2:30 PM	ZINC	282	J	MG/KG
SS33M	MIA328FD	10/8/98 2:30 PM	ZINC	299	J	MG/KG
SS33N	MIA330	10/8/98 2:05 PM	ANTIMONY	0.6	J	MG/KG
SS33N	MIA330	10/8/98 2:05 PM	ARSENIC	6.9	=	MG/KG

Table 1-1
Detected Concentrations at Surface Soil Sampling Locations in Parcels 35 and 28

StationID	SampleID	DateCollected	ParamName	AnaValue	ProjQual	Units
SS33N	MIA330	10/8/98 2:05 PM	BERYLLIUM	0.37	J	MG/KG
SS33N	MIA330	10/8/98 2:05 PM	CADMIUM	0.24	J	MG/KG
SS33N	MIA330	10/8/98 2:05 PM	CHROMIUM, TOTAL	23.8	=	MG/KG
SS33N	MIA330	10/8/98 2:05 PM	COPPER	24.6	=	MG/KG
SS33N	MIA330	10/8/98 2:05 PM	LEAD	62.3	=	MG/KG
SS33N	MIA330	10/8/98 2:05 PM	MERCURY	0.04	=	MG/KG
SS33N	MIA330	10/8/98 2:05 PM	NICKEL	10.5	J	MG/KG
SS33N	MIA330	10/8/98 2:05 PM	SELENIUM	1.3	=	MG/KG
SS33N	MIA330	10/8/98 2:05 PM	ZINC	60.6	J	MG/KG
SS33O	MIA331	10/8/98 1:40 PM	ANTIMONY	0.34	J	MG/KG
SS33O	MIA331	10/8/98 1:40 PM	ARSENIC	6.3	=	MG/KG
SS33O	MIA331	10/8/98 1:40 PM	BERYLLIUM	0.35	J	MG/KG
SS33O	MIA331	10/8/98 1:40 PM	CADMIUM	0.14	J	MG/KG
SS33O	MIA331	10/8/98 1:40 PM	CHROMIUM, TOTAL	10.8	=	MG/KG
SS33O	MIA331	10/8/98 1:40 PM	COPPER	14.8	=	MG/KG
SS33O	MIA331	10/8/98 1:40 PM	DIELDRIN	0.011	=	MG/KG
SS33O	MIA331	10/8/98 1:40 PM	LEAD	13.2	=	MG/KG
SS33O	MIA331	10/8/98 1:40 PM	MERCURY	0.03	J	MG/KG
SS33O	MIA331	10/8/98 1:40 PM	NICKEL	14	J	MG/KG
SS33O	MIA331	10/8/98 1:40 PM	SELENIUM	1.4	=	MG/KG
SS33O	MIA331	10/8/98 1:40 PM	ZINC	36.9	J	MG/KG
SS45	LAWSS45		BENZO(a)PYRENE	0.14	J	MG/KG
SS45	LAWSS45		BARIUM	85.2	=	MG/KG
SS45	LAWSS45		BENZO(a)ANTHRACENE	0.16	J	MG/KG
SS45	LAWSS45		BENZO(b)FLUORANTHENE	0.16	J	MG/KG
SS45	LAWSS45		bis(2-ETHYLHEXYL)	1.2	=	MG/KG
SS45	LAWSS45		CHROMIUM, TOTAL	138	=	MG/KG
SS45	LAWSS45		CHRYSENE	0.22	J	MG/KG
SS45	LAWSS45		COPPER	116	=	MG/KG
SS45	LAWSS45		DIMETHYL PHTHALATE	0.18	J	MG/KG
SS45	LAWSS45		FLUORANTHENE	0.34	J	MG/KG
SS45	LAWSS45		INDENO(1,2,3-c,d)PYRENE	0.12	J	MG/KG
SS45	LAWSS45		LEAD	312	=	MG/KG
SS45	LAWSS45		NICKEL	29	=	MG/KG
SS45	LAWSS45		PHENANTHRENE	0.21	J	MG/KG
SS45	LAWSS45		PYRENE	0.44	J	MG/KG
SS45	LAWSS45		ZINC	202	=	MG/KG
SS46	LAWSS46	10/27/89 12:00 AM	BARIUM	91.8	=	MG/KG
SS46	LAWSS46	10/27/89 12:00 AM	BENZO(a)ANTHRACENE	0.09	J	MG/KG
SS46	LAWSS46	10/27/89 12:00 AM	BENZO(a)PYRENE	0.084	J	MG/KG
SS46	LAWSS46	10/27/89 12:00 AM	BENZO(b)FLUORANTHENE	0.16	J	MG/KG
SS46	LAWSS46	10/27/89 12:00 AM	bis(2-ETHYLHEXYL)	1.4	=	MG/KG
SS46	LAWSS46	10/27/89 12:00 AM	CHROMIUM, TOTAL	78	=	MG/KG
SS46	LAWSS46	10/27/89 12:00 AM	CHRYSENE	0.13	J	MG/KG
SS46	LAWSS46	10/27/89 12:00 AM	COPPER	76	=	MG/KG
SS46	LAWSS46	10/27/89 12:00 AM	FLUORANTHENE	0.21	J	MG/KG
SS46	LAWSS46	10/27/89 12:00 AM	LEAD	166	=	MG/KG
SS46	LAWSS46	10/27/89 12:00 AM	NICKEL	24	=	MG/KG
SS46	LAWSS46	10/27/89 12:00 AM	PHENANTHRENE	0.12	J	MG/KG

Table 1-1
Detected Concentrations at Surface Soil Sampling Locations in Parcels 35 and 28

StationID	SampleID	DateCollected	ParamName	AnaValue	ProjQual	Units
SS46	LAWSS46	10/27/89 12:00 AM	PYRENE	0.25	J	MG/KG
SS46	LAWSS46	10/27/89 12:00 AM	ZINC	146	=	MG/KG
SS87A	MIA100	10/6/98 12:00 PM	p,p'-DDE	0.0027	J	MG/KG
SS87A	MIA100	10/6/98 12:00 PM	p,p'-DDT	0.016	=	MG/KG
SS87B	MIA102	10/6/98 1:25 PM	p,p'-DDE	0.014	J	MG/KG
SS87B	MIA102	10/6/98 1:25 PM	p,p'-DDT	0.037	=	MG/KG
SS87C	MIA103	10/6/98 1:55 PM	p,p'-DDE	0.0052	J	MG/KG
SS87C	MIA103	10/6/98 1:55 PM	p,p'-DDT	0.019	=	MG/KG
SS89A	SGB044	12/6/96 3:00 PM	CALCIUM	164000	=	MG/KG
SS89A	SGB044	12/6/96 3:00 PM	MAGNESIUM	4760	=	MG/KG
SS89A	SGB044	12/6/96 3:00 PM	ALUMINUM	3240	=	MG/KG
SS89A	SGB044	12/6/96 3:00 PM	BARIUM	30.5	=	MG/KG
SS89A	SGB044	12/6/96 3:00 PM	BERYLLIUM	0.13	J	MG/KG
SS89A	SGB044	12/6/96 3:00 PM	CADMIUM	0.41	J	MG/KG
SS89A	SGB044	12/6/96 3:00 PM	CHROMIUM, TOTAL	14.5	J	MG/KG
SS89A	SGB044	12/6/96 3:00 PM	COBALT	2.7	J	MG/KG
SS89A	SGB044	12/6/96 3:00 PM	IRON	8140	=	MG/KG
SS89A	SGB044	12/6/96 3:00 PM	LEAD	24.6	=	MG/KG
SS89A	SGB044	12/6/96 3:00 PM	MANGANESE	154	=	MG/KG
SS89A	SGB044	12/6/96 3:00 PM	NICKEL	9.3	=	MG/KG
SS89A	SGB044	12/6/96 3:00 PM	SELENIUM	3.8	J	MG/KG
SS89A	SGB044	12/6/96 3:00 PM	VANADIUM	11.2	J	MG/KG
SS89A	SGB044	12/6/96 3:00 PM	ZINC	293	=	MG/KG
SS89B	SGB039	12/6/96 3:35 PM	ARSENIC	5.7	J	MG/KG
SS89B	SGB039	12/6/96 3:35 PM	BERYLLIUM	0.21	J	MG/KG
SS89B	SGB039	12/6/96 3:35 PM	CADMIUM	1.1	=	MG/KG
SS89B	SGB039	12/6/96 3:35 PM	CHROMIUM, TOTAL	43.8	J	MG/KG
SS89B	SGB039	12/6/96 3:35 PM	COPPER	23.1	=	MG/KG
SS89B	SGB039	12/6/96 3:35 PM	LEAD	139	=	MG/KG
SS89B	SGB039	12/6/96 3:35 PM	NICKEL	12.9	=	MG/KG
SS89B	SGB039	12/6/96 3:35 PM	ZINC	1500	=	MG/KG
SS89C	SGA250	12/6/96 8:45 AM	ARSENIC	4.6	=	MG/KG
SS89C	SGA250	12/6/96 8:45 AM	CHROMIUM, TOTAL	56.1	=	MG/KG
SS89C	SGA250	12/6/96 8:45 AM	COPPER	16.2	=	MG/KG
SS89C	SGA250	12/6/96 8:45 AM	LEAD	227	=	MG/KG
SS89C	SGA250	12/6/96 8:45 AM	NICKEL	19.1	=	MG/KG
SS89C	SGA250	12/6/96 8:45 AM	ZINC	226	=	MG/KG
SS89D	SGA251	12/6/96 8:00 AM	ARSENIC	2.7	=	MG/KG
SS89D	SGA251	12/6/96 8:00 AM	CADMIUM	1.2	=	MG/KG
SS89D	SGA251	12/6/96 8:00 AM	CHROMIUM, TOTAL	15.5	=	MG/KG
SS89D	SGA251	12/6/96 8:00 AM	COPPER	8.1	=	MG/KG
SS89D	SGA251	12/6/96 8:00 AM	LEAD	14.9	=	MG/KG
SS89D	SGA251	12/6/96 8:00 AM	METHYLENE CHLORIDE	0.001	J	MG/KG
SS89D	SGA251	12/6/96 8:00 AM	NICKEL	9.4	=	MG/KG
SS89D	SGA251	12/6/96 8:00 AM	ZINC	527	=	MG/KG
SS89F	SGA253	12/6/96 3:55 PM	ARSENIC	10.5	=	MG/KG
SS89F	SGA253	12/6/96 3:55 PM	CHROMIUM, TOTAL	67.5	=	MG/KG
SS89F	SGA253	12/6/96 3:55 PM	COPPER	34.2	=	MG/KG
SS89F	SGA253	12/6/96 3:55 PM	LEAD	237	=	MG/KG

Table 1-1
Detected Concentrations at Surface Soil Sampling Locations in Parcels 35 and 28

StationID	SampleID	DateCollected	ParamName	AnaValue	ProjQual	Units
SS89F	SGA253	12/6/96 3:55 PM	METHYLENE CHLORIDE	0.002	J	MG/KG
SS89F	SGA253	12/6/96 3:55 PM	NICKEL	27.9	=	MG/KG
SS89F	SGA253	12/6/96 3:55 PM	ZINC	388	=	MG/KG
SS89H	SGA257	12/6/96 4:20 PM	ARSENIC	23.9	=	MG/KG
SS89H	SGA257	12/6/96 4:20 PM	CHROMIUM, TOTAL	443	=	MG/KG
SS89H	SGA257	12/6/96 4:20 PM	LEAD	2470	=	MG/KG
SS89H	SGA257	12/6/96 4:20 PM	CADMIUM	1.4	=	MG/KG
SS89H	SGA257	12/6/96 4:20 PM	COPPER	73.2	=	MG/KG
SS89H	SGA257	12/6/96 4:20 PM	METHYLENE CHLORIDE	0.002	J	MG/KG
SS89H	SGA257	12/6/96 4:20 PM	NICKEL	38.6	=	MG/KG
SS89H	SGA257	12/6/96 4:20 PM	ZINC	666	=	MG/KG
SS89I	SGA258	12/6/96 4:50 PM	ARSENIC	12.5	=	MG/KG
SS89I	SGA258	12/6/96 4:50 PM	CHROMIUM, TOTAL	29	=	MG/KG
SS89I	SGA258	12/6/96 4:50 PM	COPPER	29.9	=	MG/KG
SS89I	SGA258	12/6/96 4:50 PM	LEAD	30.2	=	MG/KG
SS89I	SGA258	12/6/96 4:50 PM	METHYLENE CHLORIDE	0.003	J	MG/KG
SS89I	SGA258	12/6/96 4:50 PM	NICKEL	35.4	=	MG/KG
SS89I	SGA258	12/6/96 4:50 PM	ZINC	147	=	MG/KG
SS89J	SGA259	12/6/96 5:05 PM	CHROMIUM, TOTAL	539	=	MG/KG
SS89J	SGA260FD1	12/6/96 5:05 PM	CHROMIUM, TOTAL	273	=	MG/KG
SS89J	SGA259	12/6/96 5:05 PM	LEAD	2250	=	MG/KG
SS89J	SGA260FD1	12/6/96 5:05 PM	LEAD	1310	=	MG/KG
SS89J	SGA259	12/6/96 5:05 PM	ARSENIC	10.2	=	MG/KG
SS89J	SGA260FD1	12/6/96 5:05 PM	ARSENIC	10.4	=	MG/KG
SS89J	SGA259	12/6/96 5:05 PM	CADMIUM	2.2	=	MG/KG
SS89J	SGA260FD1	12/6/96 5:05 PM	CADMIUM	1.4	=	MG/KG
SS89J	SGA259	12/6/96 5:05 PM	COPPER	88.6	=	MG/KG
SS89J	SGA260FD1	12/6/96 5:05 PM	COPPER	58	=	MG/KG
SS89J	SGA259	12/6/96 5:05 PM	METHYLENE CHLORIDE	0.003	J	MG/KG
SS89J	SGA259	12/6/96 5:05 PM	NICKEL	45.6	=	MG/KG
SS89J	SGA260FD1	12/6/96 5:05 PM	NICKEL	32.2	=	MG/KG
SS89J	SGA259	12/6/96 5:05 PM	ZINC	1460	=	MG/KG
SS89J	SGA260FD1	12/6/96 5:05 PM	ZINC	1600	=	MG/KG
SS89K	MIA153	10/8/98 3:20 PM	ANTIMONY	0.42	J	MG/KG
SS89K	MIA153	10/8/98 3:20 PM	ARSENIC	6.2	=	MG/KG
SS89K	MIA153	10/8/98 3:20 PM	CADMIUM	0.55	J	MG/KG
SS89K	MIA153	10/8/98 3:20 PM	CHROMIUM, TOTAL	22.1	=	MG/KG
SS89K	MIA153	10/8/98 3:20 PM	COPPER	17.5	J	MG/KG
SS89K	MIA153	10/8/98 3:20 PM	LEAD	39.9	=	MG/KG
SS89K	MIA153	10/8/98 3:20 PM	NICKEL	10.5	J	MG/KG
SS89K	MIA153	10/8/98 3:20 PM	ZINC	386	J	MG/KG
SS89L	MIA155	10/8/98 2:50 PM	ANTIMONY	0.34	J	MG/KG
SS89L	MIA155	10/8/98 2:50 PM	ARSENIC	7.8	=	MG/KG
SS89L	MIA155	10/8/98 2:50 PM	CADMIUM	0.29	J	MG/KG
SS89L	MIA155	10/8/98 2:50 PM	CHROMIUM, TOTAL	22.1	=	MG/KG
SS89L	MIA155	10/8/98 2:50 PM	COPPER	15.4	J	MG/KG
SS89L	MIA155	10/8/98 2:50 PM	LEAD	64.7	=	MG/KG
SS89L	MIA155	10/8/98 2:50 PM	NICKEL	13.3	J	MG/KG
SS89L	MIA155	10/8/98 2:50 PM	SELENIUM	0.56	J	MG/KG

Table 1-1
Detected Concentrations at Surface Soil Sampling Locations in Parcels 35 and 28

StationID	SampleID	DateCollected	ParamName	AnaValue	ProjQual	Units
SS89L	MIA155	10/8/98 2:50 PM	ZINC	141	J	MG/KG
SS89M	MIA156	10/8/98 1:10 PM	ARSENIC	10.8	=	MG/KG
SS89M	MIA156	10/8/98 1:10 PM	CADMIUM	0.5	J	MG/KG
SS89M	MIA156	10/8/98 1:10 PM	CHROMIUM, TOTAL	63.5	=	MG/KG
SS89M	MIA156	10/8/98 1:10 PM	COPPER	21.3	J	MG/KG
SS89M	MIA156	10/8/98 1:10 PM	LEAD	256	=	MG/KG
SS89M	MIA156	10/8/98 1:10 PM	NICKEL	12.8	J	MG/KG
SS89M	MIA156	10/8/98 1:10 PM	SELENIUM	1	=	MG/KG
SS89M	MIA156	10/8/98 1:10 PM	ZINC	170	J	MG/KG
SS89N	MIA157	10/8/98 10:15 AM	ANTIMONY	0.26	J	MG/KG
SS89N	MIA157	10/8/98 10:15 AM	ARSENIC	6.8	=	MG/KG
SS89N	MIA157	10/8/98 10:15 AM	CADMIUM	0.46	J	MG/KG
SS89N	MIA157	10/8/98 10:15 AM	CHROMIUM, TOTAL	67.9	=	MG/KG
SS89N	MIA157	10/8/98 10:15 AM	COPPER	26.9	J	MG/KG
SS89N	MIA157	10/8/98 10:15 AM	LEAD	232	=	MG/KG
SS89N	MIA157	10/8/98 10:15 AM	NICKEL	15.4	J	MG/KG
SS89N	MIA157	10/8/98 10:15 AM	SELENIUM	0.87	=	MG/KG
SS89N	MIA157	10/8/98 10:15 AM	ZINC	111	J	MG/KG
SS89O	MIA158	10/8/98 10:45 AM	ANTIMONY	0.37	J	MG/KG
SS89O	MIA158	10/8/98 10:45 AM	ARSENIC	7.1	=	MG/KG
SS89O	MIA158	10/8/98 10:45 AM	BERYLLIUM	0.87	J	MG/KG
SS89O	MIA158	10/8/98 10:45 AM	CADMIUM	0.25	J	MG/KG
SS89O	MIA158	10/8/98 10:45 AM	CHROMIUM, TOTAL	42	=	MG/KG
SS89O	MIA158	10/8/98 10:45 AM	COPPER	55.1	J	MG/KG
SS89O	MIA158	10/8/98 10:45 AM	LEAD	53	=	MG/KG
SS89O	MIA158	10/8/98 10:45 AM	NICKEL	20	J	MG/KG
SS89O	MIA158	10/8/98 10:45 AM	ZINC	53.9	J	MG/KG
TEC93A	MIA332	10/8/98 1:25 PM	ANTIMONY	0.41	J	MG/KG
TEC93A	MIA332	10/8/98 1:25 PM	ARSENIC	10.6	=	MG/KG
TEC93A	MIA332	10/8/98 1:25 PM	BERYLLIUM	0.5	J	MG/KG
TEC93A	MIA332	10/8/98 1:25 PM	CADMIUM	0.15	J	MG/KG
TEC93A	MIA332	10/8/98 1:25 PM	CHROMIUM, TOTAL	12.4	=	MG/KG
TEC93A	MIA332	10/8/98 1:25 PM	COPPER	18.9	=	MG/KG
TEC93A	MIA332	10/8/98 1:25 PM	DIELDRIN	0.084	=	MG/KG
TEC93A	MIA332	10/8/98 1:25 PM	LEAD	15.4	=	MG/KG
TEC93A	MIA332	10/8/98 1:25 PM	MERCURY	0.04	J	MG/KG
TEC93A	MIA332	10/8/98 1:25 PM	NICKEL	16.3	J	MG/KG
TEC93A	MIA332	10/8/98 1:25 PM	SELENIUM	1.1	=	MG/KG
TEC93A	MIA332	10/8/98 1:25 PM	ZINC	57.3	J	MG/KG

Table 1-2
Underground Storage Tank Cleanup Standards for Soil

Soil Permeability	< 10^{-4} cm/sec	10^{-4} to 10^{-6} cm/sec	> 10^{-6} cm/sec
Benzene-Drinking Water	5 ppm	25 ppm	50 ppm
Benzene-Non-Drinking Water	25 ppm	50 ppm	100 ppm
TPH-Drinking Water	100 ppm	250 ppm	500 ppm
TPH-Non-Drinking Water	250 ppm	500 ppm	1000 ppm

Table 1-3
Detected RCRA TCLP Concentrations

StationID	SampleID	DateCollected	ParamName	AnaValue	ProjQual	Units	RCRA Regulatory Limit
FS33A	MIA338	10/8/98 11:00 AM	Lead, TCLP	0.133 J		MG/L	5
FS33A	MIA338	10/8/98 11:00 AM	Mercury, TCLP	0.00013 J		MG/L	0.2
FS33B	MIA340	10/6/98 2:40 PM	Lead, TCLP	0.0676 J		MG/L	5
FS33C	MIA343	10/6/98 3:05 PM	Chromium, TCLP	0.0086 J		MG/L	5
FS33C	MIA343	10/6/98 3:05 PM	Lead, TCLP	0.0748 J		MG/L	5
FS33D	MIA347	10/5/98 4:15 PM	Mercury, TCLP	0.00013 J		MG/L	0.2
FS33E	MIA349	10/8/98 10:00 AM	Mercury, TCLP	0.00013 J		MG/L	0.2
FS33F	MIA352	10/5/98 5:00 PM	Mercury, TCLP	0.00013 J		MG/L	0.2
FS89P	MIA160FD	10/8/98 9:00 AM	Arsenic, TCLP	0.0742 J		MG/L	5
FS89P	MIA159	10/8/98 9:00 AM	Chromium, TCLP	0.0771 =		MG/L	5
FS89P	MIA160FD	10/8/98 9:00 AM	Chromium, TCLP	0.0621 =		MG/L	5
FS89P	MIA159	10/8/98 9:00 AM	Lead, TCLP	1.18 =		MG/L	5
FS89P	MIA160FD	10/8/98 9:00 AM	Lead, TCLP	1.04 =		MG/L	5
FS89Q	MIA165	10/8/98 2:00 PM	Chromium, TCLP	0.025 J		MG/L	5
FS89Q	MIA165	10/8/98 2:00 PM	Lead, TCLP	0.0622 J		MG/L	5
FS89R	MIA167	10/8/98 11:35 AM	Lead, TCLP	0.0667 J		MG/L	5

Table 1-4
Industrial and Residential Screening Criteria

Units	Name	EPA III Ind	EPA III Res	Back-ground	BCT Screening Values	Industrial Screening Criteria	Residential Screening Criteria
mg/kg	ACETONE	200000	7800	NA		200000	7800
mg/kg	ACENAPHTHENE	120000	4700	NA		120000	4700
mg/kg	ACENAPHTHYLENE	NA	NA	0.19		NA	NA
mg/kg	ALUMINUM	1000000	78000	23810	24000	24000	24000
mg/kg	ALDRIN	0.34	0.038	NA		0.34	0.038
mg/kg	ANTHRACENE	610000	23000	0.096		610000	23000
mg/kg	ANTIMONY	820	31	7	7	7	7
mg/kg	ARSENIC	3.8	0.43	20	20	20	20
mg/kg	BARIUM	140000	5500	234		140000	5500
mg/kg	BENZYL BUTYL PHTHALATE	410000	16000	NA		410000	16000
mg/kg	BROMODICHLOROMETHANE	92	10	NA		92	10
mg/kg	BERYLLIUM	4100	16	1.1	1.1	1.1	1.1
mg/kg	bis(2-CHLOROETHOXY) METHANE	NA	NA	NA		NA	NA
mg/kg	ALPHA BHC (ALPHA	0.91	0.1	NA		0.91	0.1
mg/kg	BETA BHC (BETA	3.2	0.35	NA		3.2	0.35
mg/kg	DELTA BHC (DELTA	NA	NA	NA		NA	NA
mg/kg	GAMMA BHC (LINDANE)	4.4	0.49	NA		4.4	0.49
mg/kg	bis(2-CHLOROETHYL) ETHER (2-	5.2	0.58	NA		5.2	0.58
mg/kg	bis(2-ETHYLHEXYL) PHTHALATE	410	46	NA		410	46
mg/kg	4-BROMOPHENYL PHENYL ETHER	120000	4500	NA		120000	4500
mg/kg	BROMOFORM	720	81	NA		720	81
mg/kg	BROMOMETHANE	2900	110	NA		2900	110
mg/kg	BENZENE	200	22	NA		200	22
mg/kg	BENZO(a)ANTHRACENE	7.8	0.87	0.71		7.8	0.87
mg/kg	BENZO(a)PYRENE	0.78	0.087	0.96	0.088	0.088	0.088
mg/kg	BENZO(b)FLUORANTHENE	7.8	0.87	0.9		7.8	0.9
mg/kg	BENZO(g,h,i)PERYLENE	NA	NA	0.82		NA	NA
mg/kg	BENZO(k)FLUORANTHENE	78	8.7	0.78		78	8.7
mg/kg	4-CHLORO-3-METHYLPHENOL	NA	NA	NA		NA	NA
mg/kg	CALCIUM	NA	NA	5840		NA	NA
mg/kg	CARBAZOLE	290	32	0.067		290	32
mg/kg	CADMIUM	2000	78	1.4		2000	78
mg/kg	CARBON DISULFIDE	200000	7800	0.002		200000	7800
mg/kg	ALPHA-CHLORDANE	NA	NA	0.029		NA	NA
mg/kg	GAMMA-CHLORDANE	NA	NA	0.026		NA	NA
mg/kg	CHRYSENE	780	87	0.94		780	87
mg/kg	4-CHLOROANILINE	8200	310	NA		8200	310
mg/kg	CHLOROBENZENE	41000	1600	NA		41000	1600
mg/kg	CHLOROETHANE	2000	220	NA		2000	220
mg/kg	CHLOROFORM	940	100	NA		940	100
mg/kg	CHLOROMETHANE	440	49	NA		440	49
mg/kg	2-CHLOROPHENOL	10000	390	NA		10000	390
mg/kg	2-CHLORONAPHTHALENE	160000	6300	NA		160000	6300
mg/kg	COBALT	120000	4700	18.3		120000	4700
mg/kg	4-CHLOROPHENYL PHENYL ETHER	NA	NA	NA		NA	NA
mg/kg	CHROMIUM, TOTAL	NA	NA	24.8	39	6100	230
mg/kg	CHROMIUM III	3100000	120000	NA		3100000	120000
mg/kg	CHROMIUM, HEXAVALENT	6100	230	NA		6100	230
mg/kg	CARBON TETRACHLORIDE	44	4.9	NA		44	4.9
mg/kg	COPPER	82000	3100	33.5		82000	3100
mg/kg	DIBENZ(a,h)ANTHRACENE	0.78	0.087	0.26		0.78	0.26
mg/kg	DIBROMOCHLOROMETHANE	68	7.6	NA		68	7.6
mg/kg	DIBENZOFURAN	8200	310	NA		8200	310
mg/kg	3,3'-DICHLOROBENZIDINE	13	1.4	NA		13	1.4

Table 1-4
Industrial and Residential Screening Criteria

Units	Name	EPA III Ind	EPA III Res	Back-ground	BCT Screening Values	Industrial Screening Criteria	Residential Screening Criteria
mg/kg	1,1-DICHLOROETHANE	200000	7800	NA		200000	7800
mg/kg	1,2-DICHLOROETHANE	63	7	NA		63	7
mg/kg	1,2-DICHLOROBENZENE	180000	7000	NA		180000	7000
mg/kg	1,3-DICHLOROBENZENE	61000	2300	NA		61000	2300
mg/kg	1,4-DICHLOROBENZENE	240	27	NA		240	27
mg/kg	1,1-DICHLOROETHENE	9.5	1.1	NA		9.5	1.1
mg/kg	TOTAL 1,2-DICHLOROETHENE	18000	700	NA		18000	700
mg/kg	cis-1,3-DICHLOROPROPENE	NA	NA	NA		NA	NA
mg/kg	trans-1,3-DICHLOROPROPENE	NA	NA	NA		NA	NA
mg/kg	2,4-DICHLOROPHENOL	6100	230	NA		6100	230
mg/kg	1,2-DICHLOROPROPANE	84	9.4	NA		84	9.4
mg/kg	p,p'-DDD	24	2.7	0.0067		24	2.7
mg/kg	p,p'-DDE	17	1.9	0.16		17	1.9
mg/kg	p,p'-DDT	17	1.9	0.074		17	1.9
mg/kg	DIETHYL PHTHALATE	1600000	63000	NA		1600000	63000
mg/kg	DIELDRIN	0.36	0.04	0.086		0.36	0.086
mg/kg	2,4-DIMETHYLPHENOL	41000	1600	NA		41000	1600
mg/kg	DIMETHYL PHTHALATE	20000000	780000	NA		20000000	780000
mg/kg	4,6-DINITRO-2-METHYLPHENOL	200	7.8	NA		200	7.8
mg/kg	DI-n-BUTYL PHTHALATE	200000	7800	NA		200000	7800
mg/kg	DI-n-OCTYLPHTHALATE	41000	1600	NA		41000	1600
mg/kg	2,4-DINITROPHENOL	4100	160	NA		4100	160
mg/kg	2,4-DINITROTOLUENE	NA	NA	NA		NA	NA
mg/kg	2,6-DINITROTOLUENE	2000	78	NA		2000	78
mg/kg	ETHYLBENZENE	200000	7800	NA		200000	7800
mg/kg	ALPHA ENDOSULFAN	NA	NA	NA		NA	NA
mg/kg	BETA ENDOSULFAN	NA	NA	NA		NA	NA
mg/kg	ENDOSULFAN SULFATE	NA	NA	NA		NA	NA
mg/kg	ENDRIN	610	23	NA		610	23
mg/kg	ENDRIN ALDEHYDE	NA	NA	NA		NA	NA
mg/kg	ENDRIN KETONE	NA	NA	NA		NA	NA
mg/kg	FLUORENE	82000	3100	NA		82000	3100
mg/kg	FLUORANTHENE	82000	3100	1.6		82000	3100
mg/kg	HEXACHLOROBUTADIENE	73	8.2	NA		73	8.2
mg/kg	HEXACHLOROCYCLOPENTADIENE	14000	550	NA		14000	550
mg/kg	HEXACHLOROBENZENE	NA	NA	NA		NA	NA
mg/kg	HEXACHLOROETHANE	NA	NA	NA		NA	NA
mg/kg	HEPTACHLOR	1.3	0.14	NA		1.3	0.14
mg/kg	HEPTACHLOR EPOXIDE	0.63	0.07	0.0077		0.63	0.07
mg/kg	2-HEXANONE	82000	3100	NA		82000	3100
mg/kg	IRON	610000	23000	37040	37000	37000	37000
mg/kg	INDENO(1,2,3-c,d)PYRENE	7.8	0.87	0.7		7.8	0.87
mg/kg	ISOPHORONE	6000	670	NA		6000	670
mg/kg	LEAD	1000	400	30	400	400	1000
mg/kg	MAGNESIUM	NA	NA	4616		NA	NA
mg/kg	MANGANESE	290000	11000	1304	1300	1300	1300
mg/kg	MERCURY	610	23	0.4		610	23
mg/kg	METHYL ETHYL KETONE (2-	1200000	47000	0.002		1200000	47000
mg/kg	2-METHYLPHENOL (o-CRESOL)	100000	3900	NA		100000	3900
mg/kg	4-METHYLPHENOL (p-CRESOL)	10000	390	NA		10000	390
mg/kg	METHYL ISOBUTYL KETONE (4-	160000	6300	NA		160000	6300
mg/kg	METHYLENE CHLORIDE	760	85	NA		760	85
mg/kg	1-METHYLNAPHTHALENE	NA	NA	NA		NA	NA
mg/kg	2-METHYLNAPHTHALENE	41000	1600	NA		41000	1600

Table 1-4
Industrial and Residential Screening Criteria

Units	Name	EPA III Ind	EPA III Res	Back-ground	BCT Screening Values	Industrial Screening Criteria	Residential Screening Criteria
mg/kg	METHOXYCHLOR	10000	390	NA		10000	390
mg/kg	NAPHTHALENE	41000	1600	NA		41000	1600
mg/kg	NICKEL	41000	1600	30		41000	1600
mg/kg	N-NITROSODIPHENYLAMINE	1200	130	NA		1200	130
mg/kg	N-NITROSODI-n-PROPYLAMINE	0.82	0.091	NA		0.82	0.091
mg/kg	NITROBENZENE	1000	39	NA		1000	39
mg/kg	2-NITROPHENOL	NA	NA	NA		NA	NA
mg/kg	4-NITROPHENOL	16000	630	NA		16000	630
mg/kg	POTASSIUM	NA	NA	2025		NA	NA
mg/kg	PCB-1016 (AROCHLOR 1016)	82	5.5	NA		82	5.5
mg/kg	PCB-1221 (AROCHLOR 1221)	2.9	0.32	NA		2.9	0.32
mg/kg	PCB-1232 (AROCHLOR 1232)	2.9	0.32	NA		2.9	0.32
mg/kg	PCB-1242 (AROCHLOR 1242)	2.9	0.32	NA		2.9	0.32
mg/kg	PCB-1248 (AROCHLOR 1248)	2.9	0.32	NA		2.9	0.32
mg/kg	PCB-1254 (AROCHLOR 1254)	2.9	0.32	NA		2.9	0.32
mg/kg	PCB-1260 (AROCHLOR 1260)	2.9	0.32	0.11		2.9	0.32
mg/kg	PENTACHLOROPHENOL	48	5.3	NA		48	5.3
mg/kg	PHENANTHRENE	NA	NA	0.61		NA	NA
mg/kg	PHENOL	1200000	47000	14		1200000	47000
mg/kg	PYRENE	61000	2300	1.5		61000	2300
mg/kg	SILVER	10000	390	2		10000	390
mg/kg	SELENIUM	10000	390	0.8		10000	390
mg/kg	SODIUM	NA	NA	NA		NA	NA
mg/kg	STYRENE	410000	16000	NA		410000	16000
mg/kg	1,1,2,2-TETRACHLOROETHANE	29	3.2	NA		29	3.2
mg/kg	TETRACHLOROETHYLENE(PCE)	110	12	NA		110	12
mg/kg	1,1,1-TRICHLOROETHANE	41000	1600	NA		41000	1600
mg/kg	1,1,2-TRICHLOROETHANE	100	11	NA		100	11
mg/kg	1,2,4-TRICHLOROBENZENE	20000	780	NA		20000	780
mg/kg	TRICHLOROETHYLENE (TCE)	520	58	NA		520	58
mg/kg	2,4,5-TRICHLOROPHENOL	200000	7800	NA		200000	7800
mg/kg	2,4,6-TRICHLOROPHENOL	520	58	NA		520	58
mg/kg	THALLIUM	140	5.5	NA		140	5.5
mg/kg	TOLUENE	410000	16000	0.002		410000	16000
mg/kg	TOXAPHENE	5.2	0.58	NA		5.2	0.58
mg/kg	VANADIUM	14000	550	48.4		14000	550
mg/kg	VINYL CHLORIDE	3	0.34	NA		3	0.34
mg/kg	Total Xylenes	4100000	160000	0.009		4100000	160000
mg/kg	ZINC	610000	23000	126	23000	23000	23000

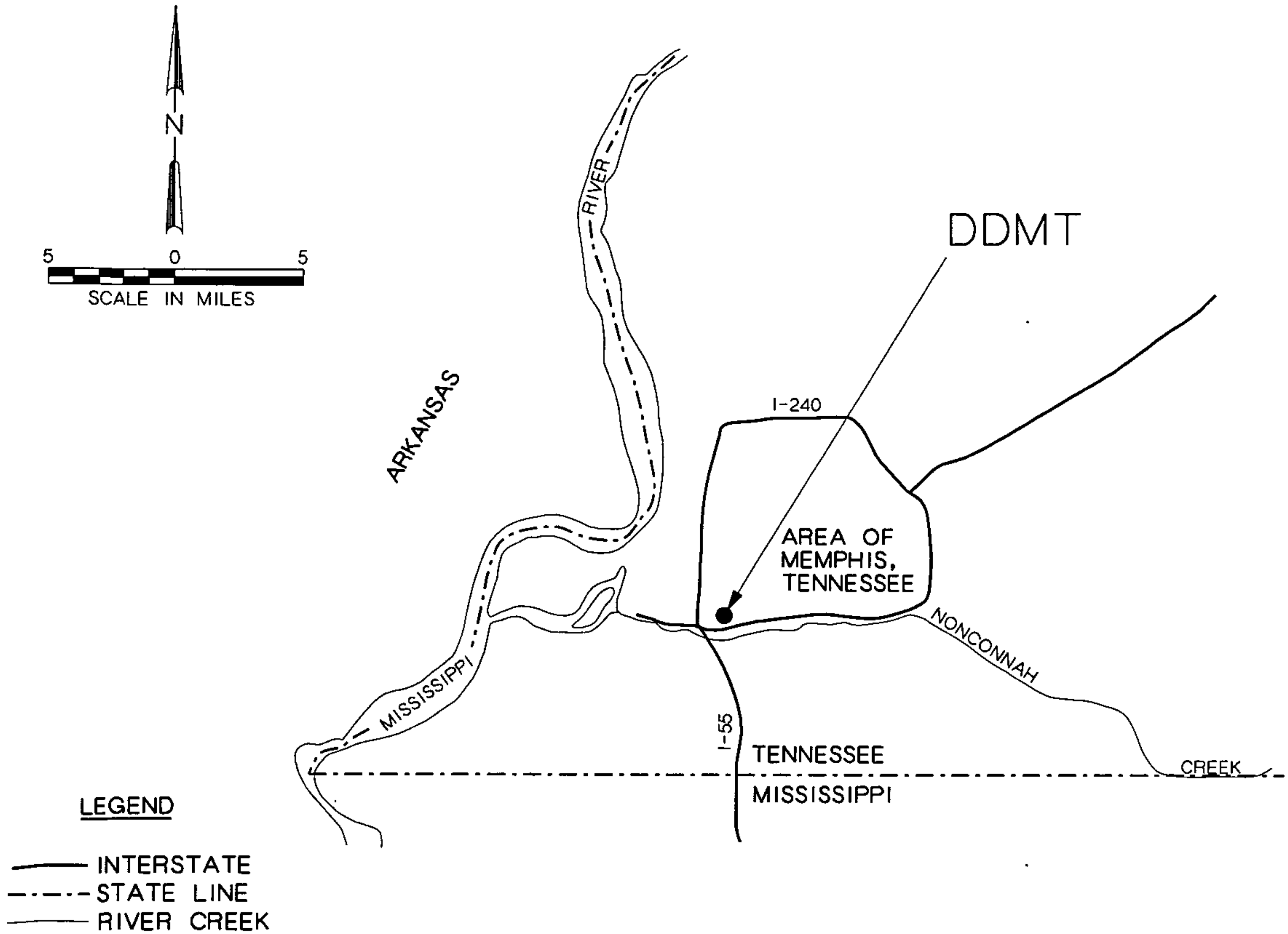
Table 1-5
Sample Locations Exceeding Industrial Screening Criteria

StationID	SampleID	DateCollected	ParamName	AnaValue	ProjQual	Units	Industrial Screening Criteria	AnaValue: ISC Ratio
B(28.1)	B106	10/18/96 1:02 PM	ALUMINUM	24700	J	MG/KG	24000	1.03
B(28.1)	B106	10/18/96 1:02 PM	IRON	38400	J	MG/KG	37000	1.04
C(35.2)	C129	10/18/96 2:03 PM	ARSENIC	71.6	J	MG/KG	20	3.58
FS33C	MIA343	10/6/98 3:05 PM	LEAD	2230	=	MG/KG	1000	2.23
SB31A	SGA015	12/18/96 8:40 AM	ARSENIC	20.6	=	MG/KG	20	1.03
SB32A	RHA012	1/18/97 2:40 PM	ANTIMONY	22.3	=	MG/KG	7	3.19
SB32A	RHA012	1/18/97 2:40 PM	ARSENIC	42.5	=	MG/KG	20	2.13
SB32A	RHA012	1/18/97 2:40 PM	BENZO(a)PYRENE	0.16	=	MG/KG	0.088	1.82
SB32A	RHA012	1/18/97 2:40 PM	LEAD	4150	=	MG/KG	1000	4.15
SS31A	SGA011	12/7/96 1:35 PM	BENZO(a)PYRENE	0.33	=	MG/KG	0.088	3.75
SS32B	RHA015	1/18/97 2:55 PM	BENZO(a)PYRENE	0.61	=	MG/KG	0.088	6.93
SS32D	RHA017	1/18/97 3:30 PM	BENZO(a)PYRENE	0.13	=	MG/KG	0.088	1.48
SS32E	RHA018	1/18/97 4:45 PM	BENZO(a)PYRENE	0.38	J	MG/KG	0.088	4.32
SS32E	RHA018	1/18/97 4:45 PM	PHENANTHRENE	0.88	=	MG/KG	0.61	1.44
SS32F	RHA019	1/18/97 5:00 PM	BENZO(a)PYRENE	0.15	=	MG/KG	0.088	1.70
SS32G	RHA021FD1	1/18/97 4:30 PM	BENZO(a)PYRENE	0.12	=	MG/KG	0.088	1.36
SS32G	RHA020	1/18/97 4:30 PM	LEAD	1580	=	MG/KG	1000	1.58
SS33E	SGB068	12/8/96 9:30 AM	BENZO(a)PYRENE	0.13	J	MG/KG	0.088	1.48
SS33K	MIA325	10/8/98 4:30 PM	ANTIMONY	10.1	J	MG/KG	7	1.44
SS33K	MIA325	10/8/98 4:30 PM	ARSENIC	22	=	MG/KG	20	1.10
SS33K	MIA325	10/8/98 4:30 PM	LEAD	1830	=	MG/KG	1000	1.83
SS45	LAWSS45		BENZO(a)PYRENE	0.14	J	MG/KG	0.088	1.59
SS89H	SGA257	12/6/96 4:20 PM	ARSENIC	23.9	=	MG/KG	20	1.20
SS89H	SGA257	12/6/96 4:20 PM	LEAD	2470	=	MG/KG	1000	2.47
SS89J	SGA259	12/6/96 5:05 PM	LEAD	2250	=	MG/KG	1000	2.25
SS89J	SGA260FD1	12/6/96 5:05 PM	LEAD	1310	=	MG/KG	1000	1.31

Table 1-6
Sample Locations Exceeding Residential Screening Criteria

StationID	SampleID	DateCollected	ParamName	AnaValue	ProjQual	Units	Residential Screening Criteria	AnaValue: RSC Ratio
B(28.1)	B106	10/18/96 1:02 PM	ALUMINUM	24700 J		MG/KG	24000	1.03
B(28.1)	B106	10/18/96 1:02 PM	IRON	38400 J		MG/KG	37000	1.04
B(35.2)	B129	10/18/96 1:55 PM	LEAD	744 J		MG/KG	400	1.86
C(35.2)	C129	10/18/96 2:03 PM	ARSENIC	71.6 J		MG/KG	20	3.58
C(35.2)	C129	10/18/96 2:03 PM	LEAD	550 J		MG/KG	400	1.38
FS33C	MIA343	10/6/98 3:05 PM	CHROMIUM, TOTAL	522 =		MG/KG	230	2.27
FS33C	MIA343	10/6/98 3:05 PM	LEAD	2230 =		MG/KG	400	5.58
FS33D	MIA347	10/5/98 4:15 PM	LEAD	667 =		MG/KG	400	1.67
FS89P	MIA159	10/8/98 9:00 AM	CHROMIUM, TOTAL	233 =		MG/KG	230	1.01
FS89P	MIA159	10/8/98 9:00 AM	LEAD	828 =		MG/KG	400	2.07
FS89P	MIA160FD	10/8/98 9:00 AM	LEAD	798 =		MG/KG	400	2.00
FS89Q	MIA164	10/8/98 1:45 PM	LEAD	897 =		MG/KG	400	2.24
SB31A	SGA015	12/18/96 8:40 AM	ARSENIC	20.6 =		MG/KG	20	1.03
SB32A	RHA012	1/18/97 2:40 PM	ANTIMONY	22.3 =		MG/KG	7	3.19
SB32A	RHA012	1/18/97 2:40 PM	ARSENIC	42.5 =		MG/KG	20	2.13
SB32A	RHA012	1/18/97 2:40 PM	BENZO(a)PYRENE	0.16 =		MG/KG	0.088	1.82
SB32A	RHA012	1/18/97 2:40 PM	CHROMIUM, TOTAL	915 =		MG/KG	230	3.98
SB32A	RHA012	1/18/97 2:40 PM	LEAD	4150 =		MG/KG	400	10.38
SS31A	SGA011	12/7/96 1:35 PM	BENZO(a)PYRENE	0.33 =		MG/KG	0.088	3.75
SS31A	SGA011	12/7/96 1:35 PM	CHROMIUM, TOTAL	530 =		MG/KG	230	2.30
SS31A	SGA011	12/7/96 1:35 PM	LEAD	664 =		MG/KG	400	1.66
SS32B	RHA015	1/18/97 2:55 PM	BENZO(a)PYRENE	0.61 =		MG/KG	0.088	6.93
SS32B	RHA015	1/18/97 2:55 PM	LEAD	678 =		MG/KG	400	1.70
SS32C	RHA016	1/18/97 3:10 PM	CHROMIUM, TOTAL	275 =		MG/KG	230	1.20
SS32C	RHA016	1/18/97 3:10 PM	LEAD	693 =		MG/KG	400	1.73
SS32D	RHA017	1/18/97 3:30 PM	BENZO(a)PYRENE	0.13 =		MG/KG	0.088	1.48
SS32D	RHA017	1/18/97 3:30 PM	LEAD	766 =		MG/KG	400	1.92
SS32E	RHA018	1/18/97 4:45 PM	BENZO(a)PYRENE	0.38 J		MG/KG	0.088	4.32
SS32E	RHA018	1/18/97 4:45 PM	PHENANTHRENE	0.88 =		MG/KG	0.61	1.44
SS32F	RHA019	1/18/97 5:00 PM	BENZO(a)PYRENE	0.15 =		MG/KG	0.088	1.70
SS32G	RHA021FD	1/18/97 4:30 PM	BENZO(a)PYRENE	0.12 =		MG/KG	0.088	1.36
SS32G	RHA020	1/18/97 4:30 PM	CHROMIUM, TOTAL	336 =		MG/KG	230	1.46
SS32G	RHA020	1/18/97 4:30 PM	LEAD	1580 =		MG/KG	400	3.95
SS32G	RHA021FD	1/18/97 4:30 PM	LEAD	563 =		MG/KG	400	1.41
SS33D	SGA028	12/8/96 10:15 AM	LEAD	751 =		MG/KG	400	1.88
SS33E	SGB068	12/8/96 9:30 AM	BENZO(a)PYRENE	0.13 J		MG/KG	0.088	1.48
SS33H	MIA334	10/8/98 12:00 PM	CHROMIUM, TOTAL	265 =		MG/KG	230	1.15
SS33H	MIA334	10/8/98 12:00 PM	LEAD	900 =		MG/KG	400	2.25
SS33K	MIA325	10/8/98 4:30 PM	ANTIMONY	10.1 J		MG/KG	7	1.44
SS33K	MIA325	10/8/98 4:30 PM	ARSENIC	22 =		MG/KG	20	1.10
SS33K	MIA325	10/8/98 4:30 PM	CHROMIUM, TOTAL	403 =		MG/KG	230	1.75
SS33K	MIA325	10/8/98 4:30 PM	LEAD	1830 =		MG/KG	400	4.58
SS45	LAWSS45		BENZO(a)PYRENE	0.14 J		MG/KG	0.088	1.59
SS89H	SGA257	12/6/96 4:20 PM	ARSENIC	23.9 =		MG/KG	20	1.20
SS89H	SGA257	12/6/96 4:20 PM	CHROMIUM, TOTAL	443 =		MG/KG	230	1.93
SS89H	SGA257	12/6/96 4:20 PM	LEAD	2470 =		MG/KG	400	6.18
SS89J	SGA259	12/6/96 5:05 PM	CHROMIUM, TOTAL	539 =		MG/KG	230	2.34
SS89J	SGA260FD	12/6/96 5:05 PM	CHROMIUM, TOTAL	273 =		MG/KG	230	1.19
SS89J	SGA259	12/6/96 5:05 PM	LEAD	2250 =		MG/KG	400	5.63
SS89J	SGA260FD	12/6/96 5:05 PM	LEAD	1310 =		MG/KG	400	3.28

Figures

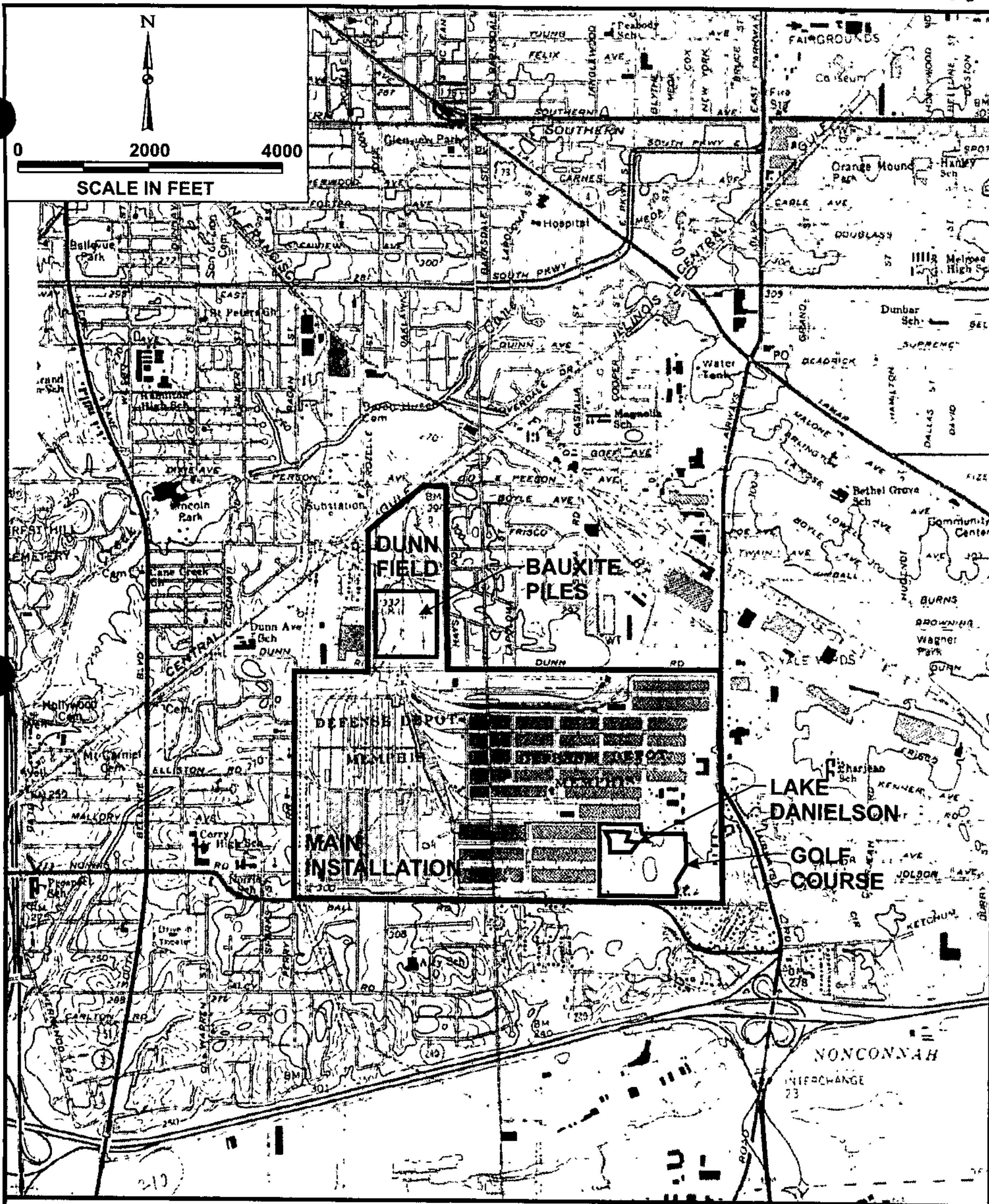


Source: Engineering-Science, 1993

FIGURE 1-1
DDMT LOCATION IN MEMPHIS METROPOLITAN AREA
Defense Depot Memphis, Tennessee

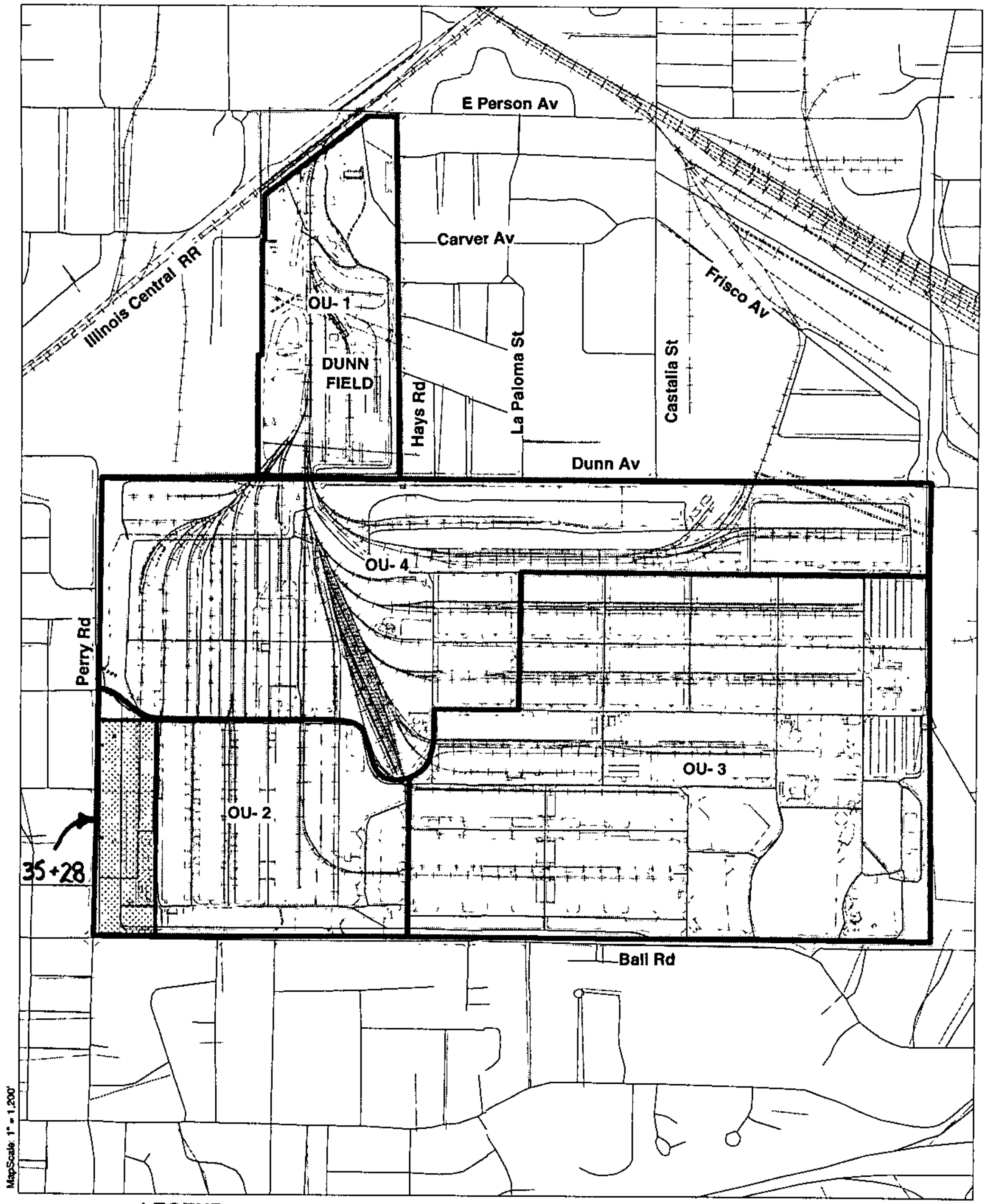
CH2M HILL

DMT-007.DGN



Source: USGS 7.5 Series Topographic Quadrangle Maps - South West Memphis Tenn.-Ark. and Southeast Memphis Tenn.

FIGURE 1-2
SURFACE TOPOGRAPHY OF DDMT AND SURROUNDING AREA OF MEMPHIS, TENNESSEE
Defense Depot Memphis, Tennessee
CH2MHILL



LEGEND

OPERABLE UNIT BOUNDARY

LIMITS OF PARCELS 35 AND 28

N W E S

0 600 1200 1800
Scale in Feet

Figure 1-3
Area of Parcels 35 and 28
Included in Removal Action
BRAC Parcels 35 and 28

CH2MHILL

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8/19/1999

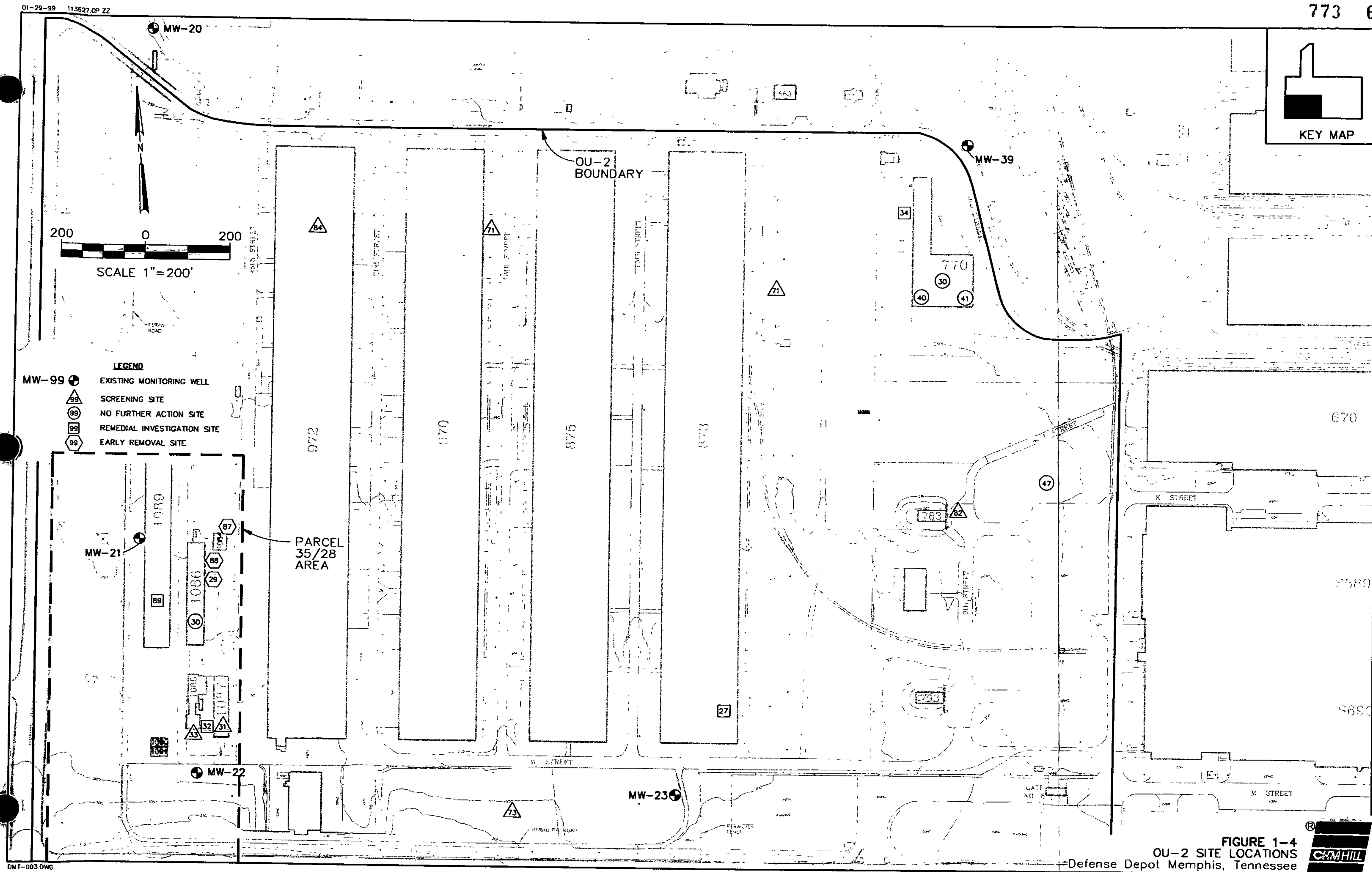


FIGURE 1-4
OU-2 SITE LOCATIONS
Defense Depot Memphis, Tennessee

CH2MHILL

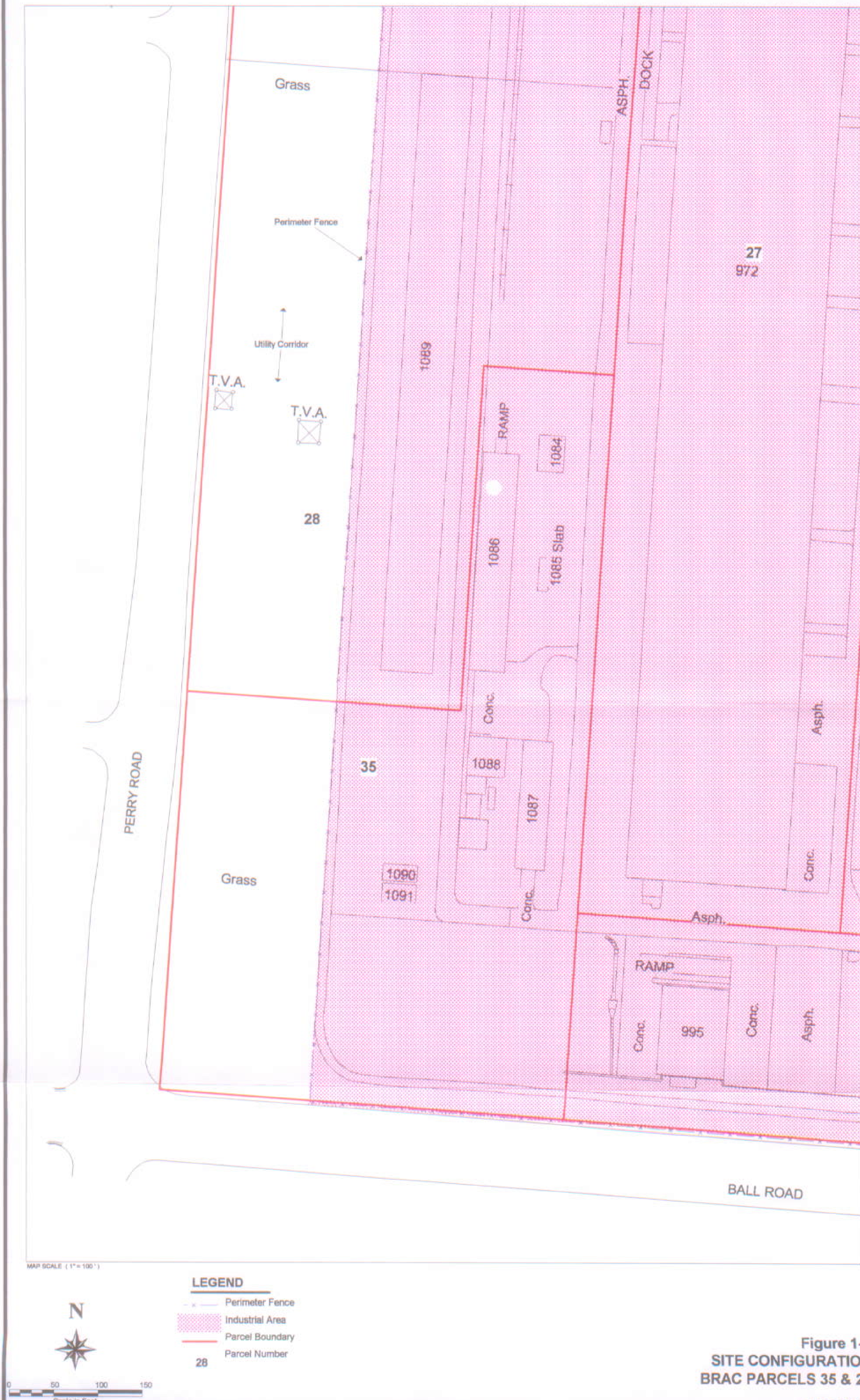
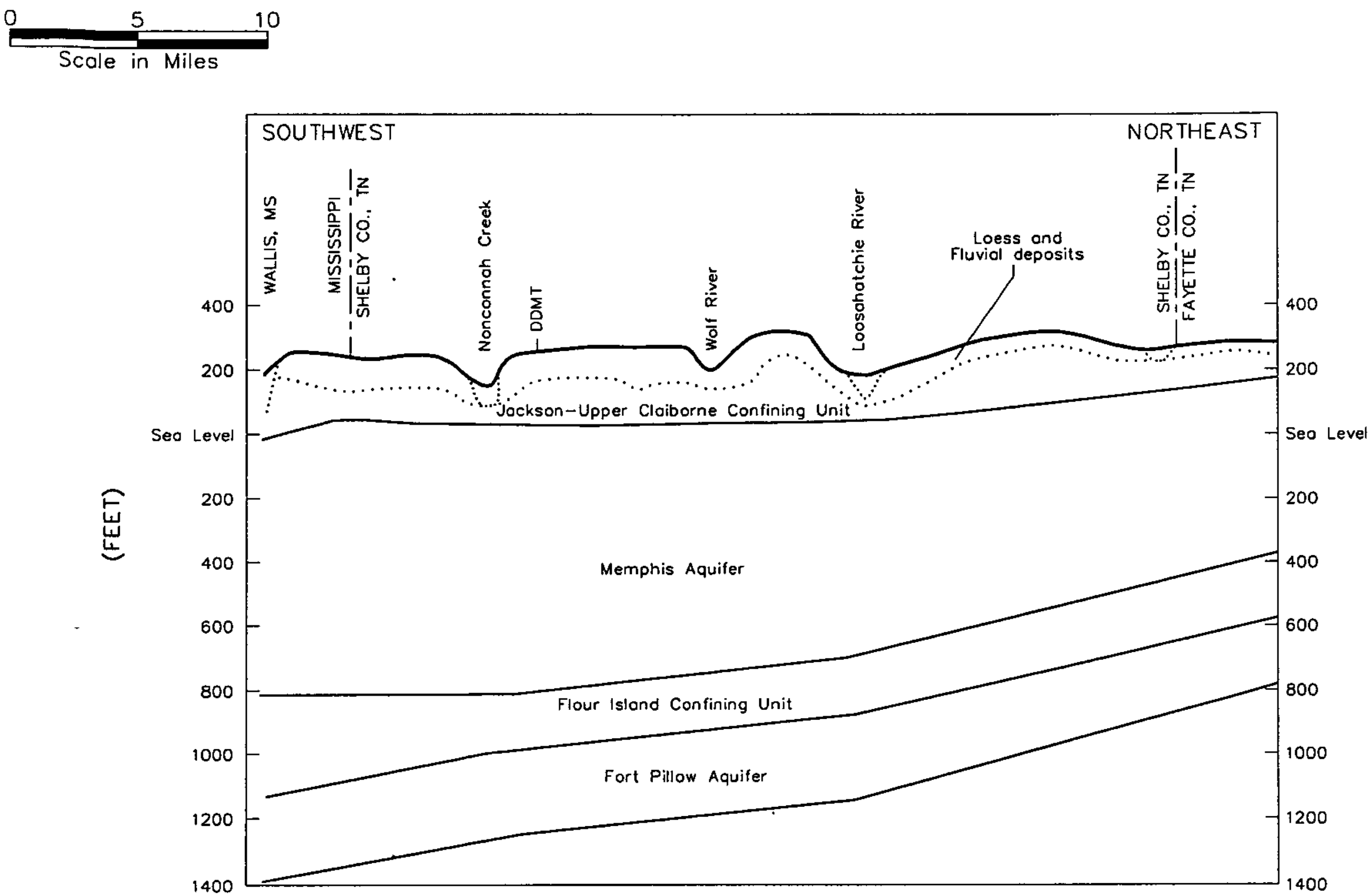


Figure 1-5
SITE CONFIGURATION
BRAC PARCELS 35 & 28

CH2MHILL

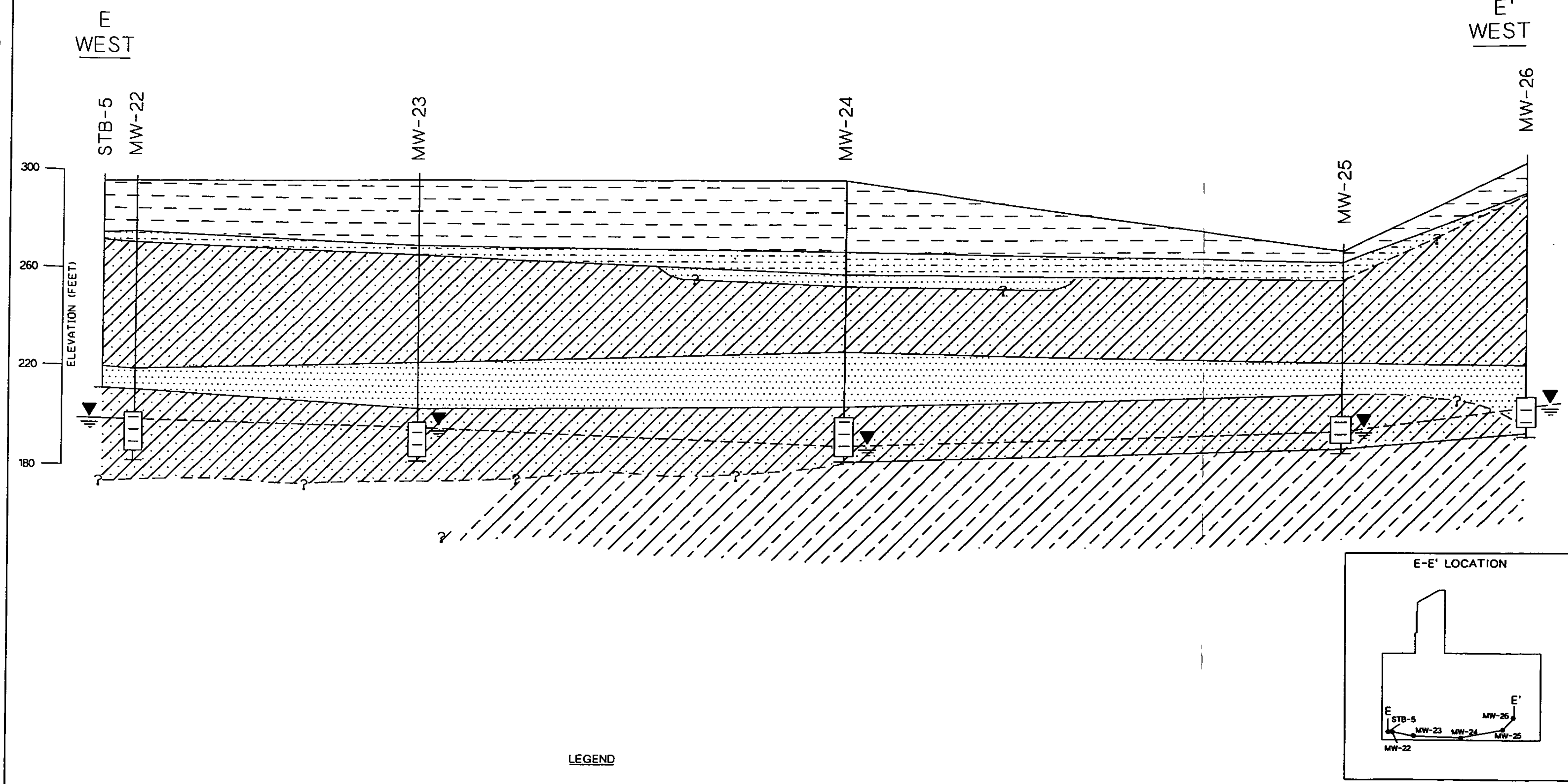
01-29-99 627.CP.ZZ

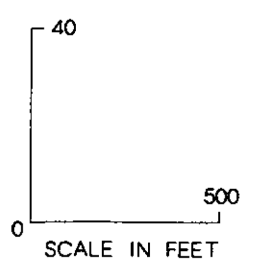


Source: Parks, 1990

FIGURE 1-6
GENERAL GEOLOGIC CROSS SECTION OF THE MEMPHIS AREA
Defense Depot Memphis, Tennessee

DMT-002.DWG





LEGEND

SILTY CLAY, CL SILTY SAND CLAY	GRAY FINE TO MEDIUM GRAINED SAND; POSSIBLY THE MEMPHIS SAND, SM
CLAYEY SAND, SC	MW-37 MONITORING WELL DESIGNATION
CLEAN, FINE TO MEDIUM GRAINED SAND, SP-SM-SW	SCREEN INTERVAL
GRAVELLY SAND, SP-GP	BT DEPTH OF BORING TERMINATED
VERY STIFF, LEAN TO SLIGHTLY SILTY CLAY; POSSIBLY THE UPPER CLAIBORNE UNIT, SC	WATER TABLE

NOTE: THIS ILLUSTRATION REPRESENTS AN INTERPRETATION OF NATURAL CONDITIONS.

Source: RI Report, 1990

FIGURE 1-7
CROSS SECTION E-E', WEST TO EAST
Defense Depot Memphis, Tennessee

CH2MHILL

DMT-004.DGN

FIGURE 1-8
Potentiometric Surface Map
DEFENSE DISTRIBUTION DEPOT, MEMPHIS TENNESSEE
CH2MHILL

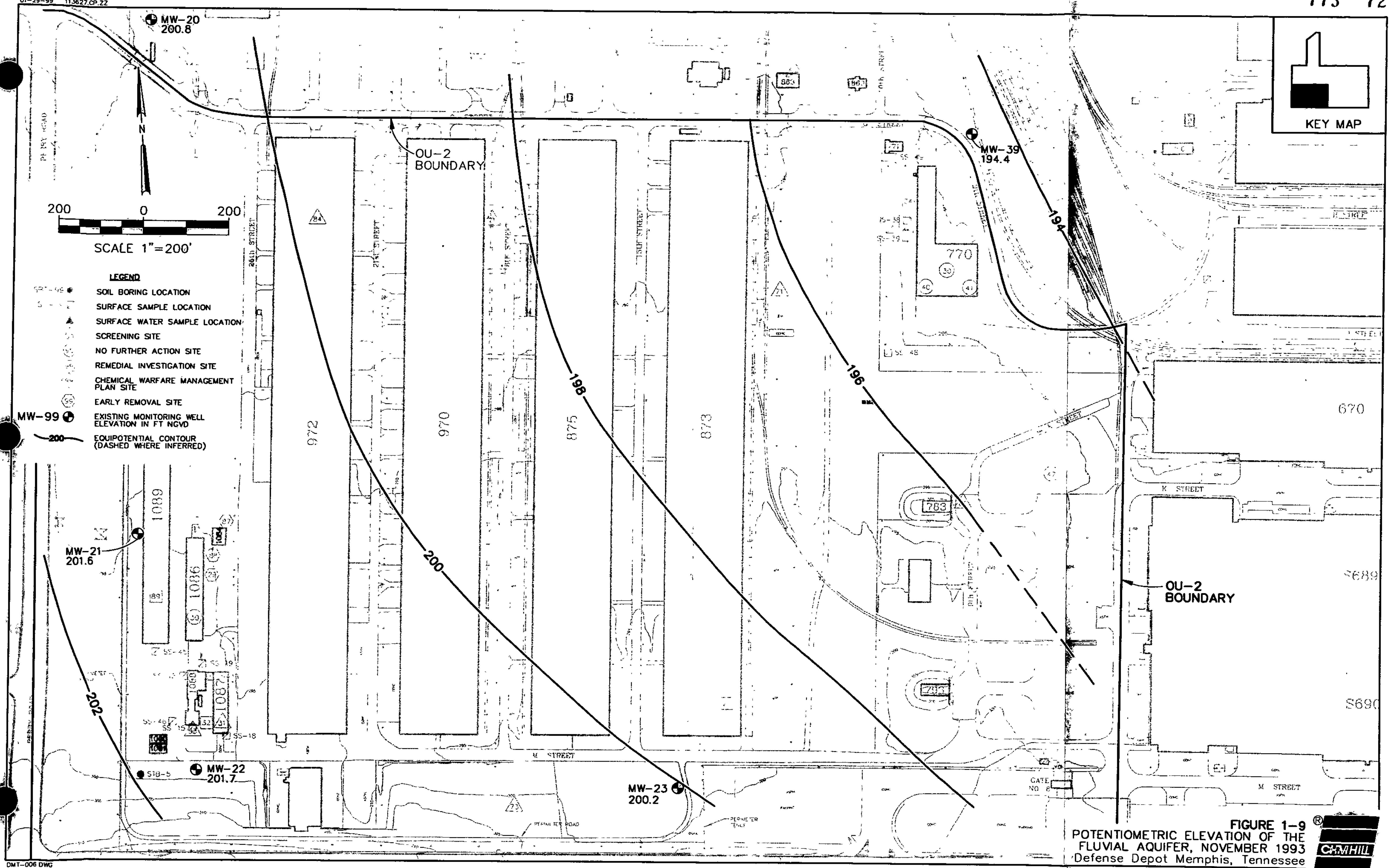


FIGURE 1-9
POTENTIOMETRIC ELEVATION OF THE FLUVIAL AQUIFER, NOVEMBER 1993
Defense Depot Memphis, Tennessee

733 73

Figure 1-10
SAMPLING LOCATIONS
BRAC PARCELS 35 & 28

CH2MHILL

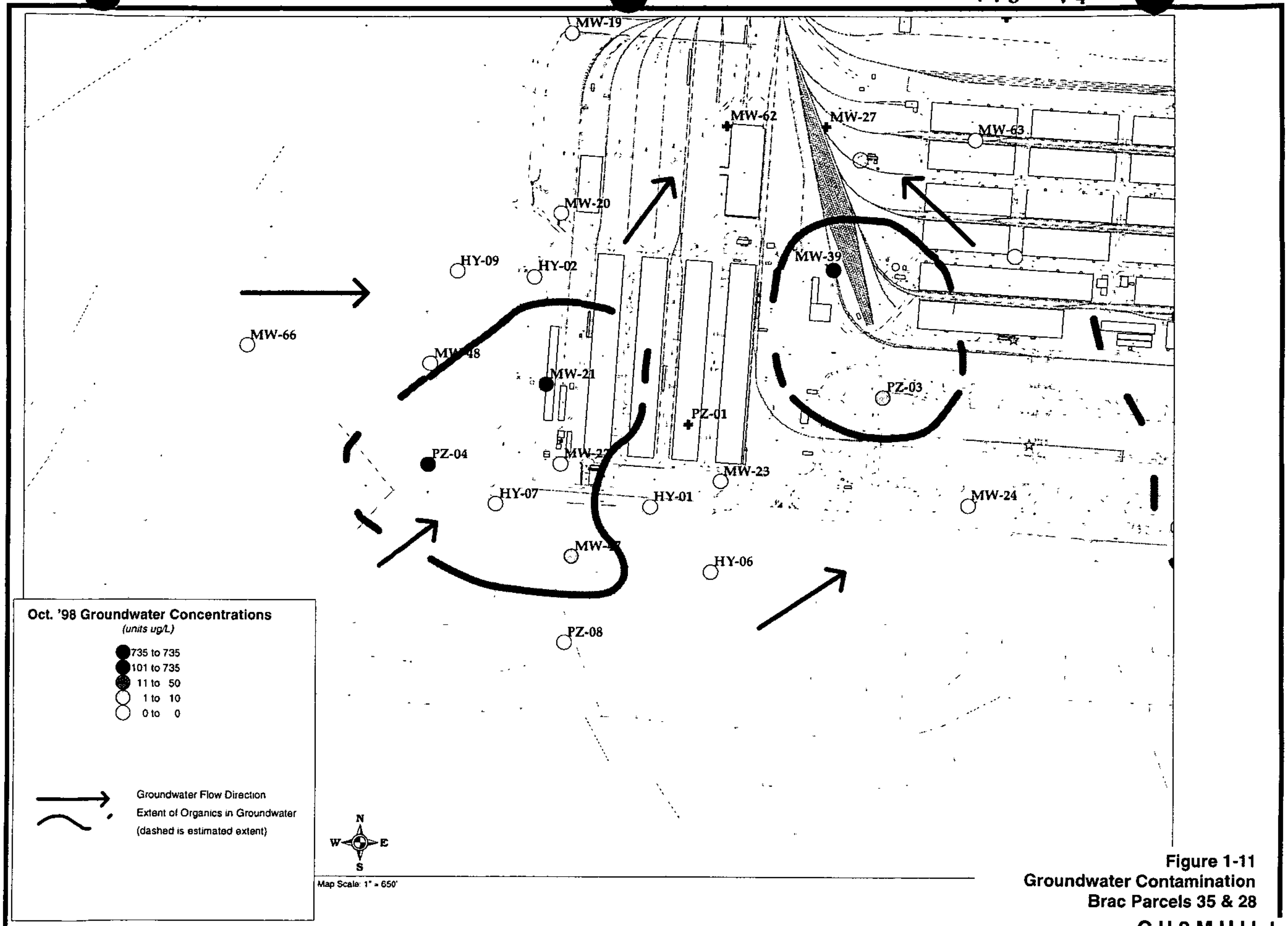


Figure 1-11
Groundwater Contamination
Brac Parcels 35 & 28

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MAP SCALE (1" = 100')

LEGEND

- Sampling Location **(Contaminants Exceeding Industrial Screening Criteria)**
- Monitoring Well Location
- BRAC Parcel Boundary
- Perimeter Fence

N

0 50 100 150
Scale in Feet

Land Use Catagories

- Grassy Area
- Concrete Area
- Gravel Area
- Asphalt Area
- Building

Figure 1-12
SAMPLING LOCATIONS EXCEEDING INDUSTRIAL SCREENING CRITERIA
BRAC PARCELS 35 & 28

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MAP SCALE (1" = 100')

LEGEND

- Sampling Location
- (Contaminants Exceeding Residential Screening Criteria)
- Monitoring Well Location
- BRAC Parcel Boundary
- 28 Parcel Number
- Perimeter Fence

N

0 50 100 150
Scale in Feet

Land Use Catagories

- Grassy Area
- Concrete Area
- Gravel Area
- Asphalt Area
- Building

Figure 1-13
SAMPLING LOCATIONS EXCEEDING RESIDENTIAL SCREENING CRITERIA BRAC PARCELS 35 & 28

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8/20/1999
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NOTE: Excavation limits shown are estimated limits for construction estimating purposes. Actual limits of excavation will be determined by analytical sampling and testing during removal actions.

MAP SCALE (1" = 100')

LEGEND

- Sampling Location
- Monitoring Well Location
- BRAC Parcel Boundary
- Excavation Limits (industrial)
- Perimeter Fence
- 28 Parcel Number

LANDUSE LEGEND

- grass
- gravel
- concrete
- asphalt

N

0 50 100 150
Scale in Feet

8/19/1999

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Figure 1-14
EXCAVATION LIMITS
SHALLOW SOIL REMOVAL
BRAC PARCELS 35 & 28

CH2MHILL

2.0 Identification of Removal Action Objectives

2.1 Removal Action Goal and Objectives

The goal of the removal action is to provide technically sound, cost-effective, and timely measures that will result in an acceptable risk to human health from contaminants located in the vicinity of Parcels 35 and 28. Specific objectives of the removal action include the following:

- Reduce the potential risk to long-term site users to a level deemed acceptable to EPA and TDEC;
- Be technically appropriate and feasible to accomplish using commonly accepted construction practices;
- Minimize, to the extent possible, the volumes of materials that must be removed and landfilled offsite;
- Have a reasonable and acceptable cost;
- Be implemented in an expedited manner to meet Base Realignment and Closure (BRAC) parcel transfer and leasing schedules; and
- Involve minimal post-removal operational, maintenance, or monitoring requirements.

2.2 Statutory Limits on Removal Actions

Non-time-critical removal actions funded by EPA have a $2 million and a 12-month statutory limit pursuant to Section 104(c)(1) of Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA). Because removal actions at the Memphis Depot are not being funded by EPA, these statutory limits do not apply.

2.3 Determination of Removal Scope

Removal actions are defined in EPA 540-R-93-057, *Guidance on Conducting Non-Time-Critical Removal Actions Under CERCLA*, EPA, August 1993, as: "The cleanup or removal of released hazardous substances from the environment, such actions as may necessarily be taken in the event of the threat or release of hazardous substances into the environment, such actions as may be necessary to monitor, assess, and evaluate the release or threat of release of hazardous substances, the disposal of removed materials, or the taking of other actions as may be necessary to prevent, minimize, or mitigate damage to the public health or welfare, or to the environment, which may otherwise result from a release or threat of release."

2.4 Determination of Removal Schedule

Although the 12-month statutory limit on EPA-led removal actions does not apply, the areas in Parcels 35 and 28 are high-priority sites for turnover as part of the BRAC process. Therefore, it is assumed that the work must be completed within 12 months after approval of selected removal actions.

2.5 Planned Removal Actions

Planned removal actions should be capable of being developed and implemented using current removal action contracting mechanisms at the Memphis Depot. During previous removal action activities at the Depot, it has been demonstrated that the use of the existing service contractor, equipment, procedures, and subcontract/vendor arrangements provide for expedited and cost-effective work.

All removal actions must conform with appropriate federal, state, local, and facility environmental protection, health and safety, and security requirements. It should be assumed that these requirements will be met using measures similar to those used for previous removal actions at the Depot.

3.0 Identification and Analysis of Removal Action Alternatives

3.1 Removal Action Alternatives

The selection of removal action alternatives included the identification of a few alternatives that appear to be appropriate at the site, that can be done with existing contracting mechanisms, and that appear to meet the removal action objectives and requirements stated in the previous section. The following three alternatives were identified:

Alternative 1: Decontaminate Existing Metal and Masonry Buildings and Associated Equipment for In-Place BRAC Transfer; Remove and Dispose of Wooden Structures, Contaminated Soil, and Debris;

Alternative 2: Decontaminate Existing Metal and Masonry Buildings for In-Place BRAC Transfer; Decontaminate, Remove, and Dispose of Associated Equipment; and Remove and Dispose of Wooden Structures, Contaminated Soil, and Debris; and

Alternative 3: Decontaminate, Remove, and Dispose of All Above-Grade Buildings and Associated Equipment and Remove and Dispose of Contaminated Soil and Debris.

3.1.1 Alternative 1: Decontaminate Existing Metal and Masonry Buildings and Associated Equipment for In-Place BRAC Transfer; Remove and Dispose of Wooden Structures, Contaminated Soil, and Debris

Alternative 1 represents the minimum level of effort required to facilitate the safe turnover of existing Parcels 35 and 28 facilities for reuse. It includes the removal of environmental contamination and leaves all metal and masonry structures, including existing equipment, intact for a future use that is similar to the past use of the area. The only building to be removed is Building 1084, a wooden structure that would be less expensive to fully decontaminate and leave in place.

Specific elements of Alternative 1 include:

- Full decontamination and confirmatory sampling of Buildings 1086, 1087, 1088, 1089, 1090, and 1091, including slabs and equipment, for future industrial use.
- Decontamination (removal of gross contamination) and removal of the wooden shed structure for Building 1084, and full decontamination of the floor slab for in-place closure. (Gross contamination refers to loose dust, debris, and surface residue that can be easily removed by vacuuming or mild washing. If not removed, this gross contamination is susceptible to spreading and contaminating workers or equipment.)
- Inspection and removal of contaminated soil, concrete, and drainage system sediment, as necessary, at selected locations at Buildings 1084, 1086, 1087, 1088, and 1089, where possible contamination is suspected.
- Sampling and removal of the hydraulic tank, concrete, and contaminated soil, as necessary, to the industrial screening criteria at the former grease rack/UST location at Building 1085.
- Removal of up to 12 inches of contaminated surface soil within the fenced industrial portion of Parcels 35 and 28 where previous sampling suggests the presence of surface soil contamination in excess of the industrial screening criteria.
- Additional sampling of the upper 12 inches of surface soil in the grassed utility corridor portion of Parcels 35 and 28 for lead and PAHs.
- Removal of up to 12 inches of contaminated surface soil within the utility corridor to the residential screening criteria if additional sampling in the area suggests that elevated lead and PAH levels are related to past activities in the industrial portion of Parcels 35 and 28. Otherwise, no further action in the utility corridor.
- Replacement of excavated areas with clean soil.

The industrial and residential screening criteria referred to above are presented in Table 1-4.

3.1.2 Alternative 2: Decontaminate Existing Metal and Masonry Buildings for In-Place BRAC Transfer; Decontaminate, Remove, and Dispose of Associated Equipment; and Remove and Dispose of Wooden Structures, Contaminated Soil, and Debris

Alternative 2 is similar to Alternative 1, except that it is assumed that all government equipment will also be removed from the buildings once decontaminated. In essence, all masonry and metal buildings in Parcels 35 and 28 would be turned over intact, but empty and ready for industrial reuse.

Specific elements of Alternative 2 include:

- Decontamination (removal of gross contamination), removal, and disposal of paint booths, racks, and sandblast equipment in Buildings 1086, 1087, 1088, 1089, 1090, and 1091.
- Full decontamination and confirmatory sampling of Buildings 1086, 1087, 1088, 1089, 1090, and 1091, including slabs, for future industrial use.
- Decontamination (removal of gross contamination) and removal of the wooden shed structure for Building 1084, and full decontamination of the floor slab for in-place closure.
- Inspection and removal of contaminated soil, concrete, and drainage system sediment, as necessary, at selected locations at Buildings 1084, 1086, 1087, 1088, 1089, 1090, and 1091 where possible contamination is suspected.
- Sampling and removal of the hydraulic tank, concrete, and contaminated soil, as necessary, to the industrial screening criteria at the former grease rack/UST location at Building 1085.
- Removal of up to 12 inches of contaminated surface soil within the fenced industrial portion of Parcels 35 and 28 where previous sampling suggests the presence of surface soil contamination in excess of the industrial screening criteria.
- Additional sampling of the upper 12 inches of surface soil in the grassed utility corridor portion of Parcels 35 and 28 for lead and PAHs.

- Removal of up to 12 inches of contaminated surface soil within the utility corridor to the residential screening criteria if additional sampling in the area suggests that elevated lead and PAH levels are related to past activities in the industrial portion of Parcels 35 and 28. Otherwise, no further action in the utility corridor.

- Replacement of excavated areas with clean soil.

The industrial and residential screening criteria referred to above are presented in Table 1-4.

3.1.3 Alternative 3: Decontaminate, Remove, and Dispose of All Above-Grade Buildings and Associated Equipment and Remove and Dispose of Contaminated Soil and Debris

Alternative 3 is similar to Alternatives 1 and 2, except that all buildings would be decontaminated and removed, leaving only their decontaminated slabs in place. Slabs would only be removed to the extent necessary to remediate specific areas of known or suspected contamination (e.g., at cracks and drains).

Specific elements of Alternative 3 would include:

- Decontamination (removal of gross contamination), removal, and disposal of paint booths, racks, and sandblast equipment in Buildings 1086, 1087, 1088, 1089, 1090, and 1091.

- Decontamination (removal of gross contamination), removal, and off-site disposal of Buildings 1084, 1086, 1087, 1088, 1089, 1090, and 1091, full decontamination of at-grade slabs.

- Inspection and removal of contaminated soil, concrete, and drainage system sediment, as necessary, at selected locations at Buildings 1084, 1086, 1087, 1088, 1089, 1090, and 1091 where possible contamination is suspected.

- Sampling and removal of the hydraulic tank, concrete, and contaminated soil, as necessary, to the industrial screening criteria at the former grease rack/UST location at Building 1085.

- Removal of up to 12 inches of contaminated surface soil within the fenced industrial portion of Parcels 35 and 28 where previous sampling suggests the presence of surface soil contamination in excess of the industrial screening criteria.

- Additional sampling of the upper 12 inches of surface soil in the grassed utility corridor portion of Parcels 35 and 28 for lead and PAHs.
- Removal of up to 12 inches of contaminated surface soil within the utility corridor to the residential screening criteria if additional sampling in the area suggests that elevated lead and PAH levels are related to past activities in the industrial portion of Parcels 35 and 28. Otherwise, no further action in the utility corridor.
- Replacement of excavated areas with clean soil.

The industrial and residential screening criteria referred to above are presented in Table 1-4.

3.2 Evaluation Criteria

Evaluation criteria for evaluating and comparing alternatives conform with evaluation criteria used by EPA for all removal actions under CERCLA. They include effectiveness, implementability, and cost. The components of each are described below.

3.2.1 Effectiveness

The effectiveness criterion addresses the expected results of the removal alternatives. It includes two major subcategories: protectiveness and ability to achieve the removal objectives.

Protectiveness

To be protective, the removal alternative must be:

- Protective of public health and the community;
- Protective of workers during implementation;
- Protective of the environment; and
- Compliant with ARARs.

Ability to Achieve Removal Objectives

To successfully achieve the removal objectives, the removal alternative must:

- Meet the expected level of treatment or containment;
- Have no residual effect concerns; and
- Will maintain control over the long-term.

Table 3-1 summarizes the initial evaluation of each of the alternatives in relation to the effectiveness criterion. Results of this evaluation indicate that all of the alternatives can be effective and can meet the removal objectives.

3.2.2 Implementatibility

The implementability criterion encompasses the technical and administrative feasibility of the removal action. It includes three subcategories: technical feasibility, availability of resources, and administrative feasibility.

Technical Feasibility

Technical feasibility includes:

- Construction and operational considerations;
- Demonstrated performance and useful life;
- Adaptability to environmental conditions;
- Contribution to performance of long-term removal actions; and
- Implementation within the allotted time.

Availability of Resources

Availability of resources includes:

- Availability of equipment;
- Availability of personnel and services;
- Laboratory testing capacity;
- Off-site treatment and disposal capacity; and
- Post-removal site control.

Administrative Feasibility

Administrative feasibility includes:

- Required permits;
- Required easements or rights-of-way;
- Impacts on adjoining property;
- Ability to impose institutional controls; and
- Likelihood of obtaining exemptions from statutory limits (if needed).

Table 3-2 summarizes the initial evaluation of each of the alternatives in relation to the implementability criterion. Results indicate that all can be implemented.

3.2.3 Cost

The cost criterion typically encompasses the life-cycle costs of a project, including the projected implementation costs and the long-term operational and maintenance costs of the remedial action. Because alternatives with no long-term operational and maintenance requirements have been considered, only implementation costs are used for the comparison of alternatives.

Implementation costs include three subcategories of cost: capital costs, post-remediation site control costs, and present-worth costs. Of these, only capital costs, including direct capital costs and indirect costs, are applicable because contamination will be removed and no post-removal operational or maintenance activities will be required. Present-worth costs do not apply because the project can be accomplished within a single year and there are no long-term costs thereafter.

Direct capital costs include actual costs of the removal action, such as:

- Construction costs;
- Equipment and material costs;
- Buildings and service costs;
- Transport and disposal costs;
- Analytical costs; and
- Contingency allowances.

Other commonly encountered direct capital costs, such as land and site acquisition costs, relocation expenses, and treatability costs are not applicable to this project.

Indirect capital costs typically include nonconstruction costs of the removal action, such as:

- Engineering and design expenses;
- Legal fees and license or permit fees; and
- Startup and shakedown costs for processes and equipment.

Of these, only engineering and design expenses, and potentially some local permit fees, are applicable to removal activities in Parcels 35 and 28. For estimating purposes, these expenses are estimated to be about 10 percent of the construction cost, a value typical of projects of this size and scope.

Table 3-3 summarizes the comparative costs for each of the alternatives, including direct costs, indirect costs, and total cost. These comparative costs, which were prepared for evaluating and comparing alternatives, are order-of-magnitude capital costs. Order-of-magnitude estimates are made without detailed engineering data and included estimates of major cost components and quantities, typical costs for similar work, cost curves, and scale-up or scale-down factors or ratios. It is normally expected that estimates of this type would be accurate to within plus 50 percent to minus 30 percent.

All direct capital costs were developed using the U.S. Army Corps of Engineers' Micro-Computer Aided Cost Estimating System—Gold Software Copyright (MCACES Gold) estimating system. MCACES Gold estimates for each alternative may be found in the Appendix at the end of the document. The cost estimates shown have been prepared for guidance in project evaluation and implementation from the information available at the time of the estimate. The final costs of the project will depend on actual labor and material costs, competitive market conditions, final project costs, implementation schedule, and other variable factors. As a result, the final project costs will vary from the estimates presented herein. Because of this, project feasibility and funding needs must be carefully reviewed prior to making specific financial decisions to help ensure proper project evaluation and adequate funding. The following assumptions were used in these estimates:

- The scope of work for each alternative will be as described above.
- The following contingencies were included to account for unknown variables:
  - Design Contingency — 5 percent;
  - Construction Contingency — 15 percent; and
  - Other Government Costs — 8 percent.

- Direct cost data are based on unit costs for similar items from similar work in the housing and cafeteria areas, vendor quotes, and current MCACES Gold cost data for the Memphis area.
- Indirect costs for engineering and design are based on MCACES Gold data.
- The work area is within or adjacent to a secured government site and is of sufficient size and configuration to support all work. No additional site security, land acquisition, or relocation costs will be incurred, except for some temporary security fencing and a gate should further sampling in the utility corridor indicate that removal actions in that area are necessary.
- Although the intent of applicable regulatory and permit requirements will be included in the removal actions, the work area is within a CERCLA site and no special licenses or permits will be necessary to conduct the work.
- Waste materials are predominately nonhazardous and can be disposed of at a local nonhazardous industrial waste landfill.
- Up to 1,150 cubic yards (1,800 tons) of contaminated soil will require removal and disposal. This includes removal of contaminated surface soil from areas shown in Figure 1-14, removal of contaminated soil associated with activities at Buildings 1084 and 1085, and a contingency of up to 550 cubic yards for potential surface soil removal requirements in identified areas of elevated lead and PAH concentrations near Perry Road. This contingency, however, will only be exercised if further sampling in the utility corridor indicates that these elevated concentrations are in fact associated with previous industrial activities in Parcels 35 and 28.
- Up to 15 tons of RCRA hazardous waste may be present and will require transportation and disposal at a hazardous waste landfill at Emelle, Alabama.
- Wastewater will be collected, sampled, and disposed of at the local publicly owned treatment works (POTW) in a manner similar to that which was done during previous removals at the Memphis Depot.

- Asbestos-containing materials (ACM) removed as part of the work can be packaged and disposed of at a local landfill licensed to accept asbestos waste. This will result in about 1 cubic yard of asbestos waste.
- Scrap metal structural members, sheeting, and equipment parts will be decontaminated and transported to a local scrap metal yard for disposal as recyclable metal. A credit of $40 per ton of recycled metal is assumed on the basis of the current purchase price of steel by a local scrap yard.
- All initial decontamination and asbestos removal will require Level C protective measures. Once dust has been removed, all other work will be done with Level D protective measures.
- Decontamination and sampling requirements will depend on final disposition of materials and the following criteria:
  - Decontamination of materials to be left in place will include vacuuming of dust, washdown, and confirmation sampling.
  - Decontamination of materials to be removed to a metals recycling facility will require vacuuming and washdown to remove surface contamination, but no sampling.
  - Decontamination of materials to be disposed of in a landfill will be limited to vacuuming or washdown to the extent necessary to prevent dust generation or spread of contaminants.
  - All concrete slabs will be decontaminated and left in place. Drain traps and pipes will be cleaned, flushed, and left in place.
- Strategic trench excavations will be required at Buildings 1084 and 1085 to investigate, remove, and sample a former buried gravel drain and UST locations noted on the drawings. All other soil excavations will be shallow excavations to a depth of 12 inches.
- Sampling and analysis requirements during construction will include the following general criteria:

- Level-2 wipe samples will be taken at all building components to be decontaminated and left in place. This will average 12 samples per building for Alternative 1, and 8 samples per building for Alternative 2. No samples will be taken for materials decontaminated and removed for disposal. Samples will be analyzed for priority pollutant metals.
- Level-2 soil samples will be taken at an average of three samples per excavation areas, plus two quality control (QC) samples. Samples will be analyzed for priority pollutant metals and PAH constituents.
- Level-3 decontamination wipe samples and Level-3 soil samples will be taken at an average or one sample for every five Level-2 samples, plus two QC samples.
- A composite confirmation sample will be taken at the completion of strategic excavations of Buildings 1084 and 1085. These samples are assumed to have Level-3 full-scan analyses (volatiles, acid-base neutrals, pesticides/PCB, target analyte list (TAL) metals, cyanide, phenols, dioxin) to confirm remaining constituents.
- Approximately four TCLP analyses will be required to confirm disposal requirements.

  Note: Level-2 samples are screening-level analytical samples used for evaluating the presence of contaminants exceeding a specified concentration and for determining apparent achievement of removal action levels. The data package for Level-2 samples is limited to the analytical results of the samples and analytical results of associated QC samples. Level-3 samples are confirmatory-level analytical samples used for evaluating and confirming Level-2 data and for determining if additional actions are required. Level-3 analytical results require a data package documenting the QC and data quality evaluation process used to validate the accuracy of the analytical data. QC samples include additional field and laboratory samples used to verify the accuracy of analytical results and the potential effects of laboratory and field procedures and reagents on the analytical results.

- Site restoration will include the following:
  - Granular soil backfill and seeding in all excavated grassed areas.

  - Gravel surfacing in all gravel area excavations to 12 inches in depth.
  - Granular soil backfill and 12 inches of gravel surfacing in all gravel area excavations in excess of 12 inches.

- Granular soil backfill and an average of 6 inches of concrete in all areas where concrete and soil were removed.

- All granular soil and gravel backfill will be sampled and subjected to a Level 3 full-scan analysis (volatiles, acid-base neutrals, pesticides/PCB, TAL metals, cyanide, phenols, and dioxins) at a rate of one sample for every 1,000 cubic yards to confirm that they are clean.

Tables 3-1, 3-2, 3-3

Table 3-1
Initial Evaluation of Alternatives with Effectiveness Criterion

Alternative	Protectiveness	Ability to Achieve Removal Objectives
Alternative 1 – Decontaminate Existing Metal and Masonry Buildings and Associated Equipment; Remove and Dispose of Wooden Structures, Contaminated Soil, and Debris	Removes contamination within reasonable access to the public, onsite workers, or environmental targets. Worker contact during implementation is minimized. Required cleanup requirements will be met.	Capable of meeting risk-based cleanup criteria for proposed site use. Provides minimal residual effect concerns. Removal of accessible contaminants provides long-term protection and control.
Alternative 2 – Decontaminate Existing Metal and Masonry Buildings; Decontaminate, Remove, and Dispose of Associated Equipment; and Remove and Dispose of Wooden Structures, Contaminated Soil, and Debris	Removes contamination within reasonable access to the public, onsite workers, or environmental targets. Reasonable worker contact during equipment removal. Required cleanup requirements will be met.	Capable of meeting risk-based cleanup criteria for proposed site use. Provides minimal residual effect concerns. Removal of accessible contaminants provides long-term protection and control.
Alternative 3 – Decontaminate, Remove and Dispose of All Above-Grade Buildings, Associated Equipment, Contaminated Soil, and Debris	Removes potential above-grade contamination. Removes other contamination within reasonable access. Increased, but reasonable worker contact during equipment and building removal. Required cleanup requirements will be met.	Capable of meeting risk-based cleanup criteria for proposed site use. Provides minimal residual effect concerns. Removal of accessible contaminants provides long-term protection and control.

Table 3-2
Initial Evaluation of Alternatives with Implementability Criterion

Alternative	Technical Feasibility	Availability of Resources	Administrative Feasibility
Alternative 1 – Decontaminate Existing Metal and Masonry Buildings and Associated Equipment; Remove and Dispose of Wooden Structures, Contaminated Soil, and Debris	Common practices similar to those already used at the Memphis Depot. Capable of meeting cleanup objectives in a reasonable time.	Existing contractors and laboratories have needed expertise. Local disposal facilities have capacity for accepting waste. Within existing controlled access area.	Within existing government property. Can be done without off-site impacts, except traffic. Institutional controls possible, but not required. No exemptions expected.
Alternative 2 – Decontaminate Existing Metal and Masonry Buildings; Decontaminate, Remove, and Dispose of Associated Equipment; and Remove and Dispose of Wooden Structures, Contaminated Soil, and Debris	Common practices similar to those already used at the Memphis Depot. Capable of meeting cleanup objectives in a reasonable time.	Existing contractors and laboratories have needed expertise. Local disposal facilities have capacity for accepting waste/debris. Within existing controlled access area.	Within existing government property. Can be done without off-site impacts, except traffic. Institutional controls possible, but not required. No exemptions expected.
Alternative 3 – Decontaminate, Remove and Dispose of All Above-Grade Buildings, Associated Equipment, Contaminated Soil, and Debris	Common practices similar to those already used at the Memphis Depot. Capable of meeting cleanup objectives in a reasonable time.	Existing contractors and laboratories have needed expertise. Local disposal facilities have capacity for accepting waste. Within existing controlled access area.	Within existing government property. Can be done without off-site impacts, except traffic. Institutional controls possible, but not required. No exemptions expected.

Table 3-3
Initial Evaluation of Alternatives with Cost Criterion

Alternative	Direct Capital Cost	Indirect Cost*	Total Cost
Alternative 1 – Decontaminate Existing Metal and Masonry Buildings and Associated Equipment; Remove and Dispose of Wooden Structures, Contaminated Soil, and Debris	$858,000	$86,000	$944,000
Alternative 2 – Decontaminate Existing Metal and Masonry Buildings; Decontaminate, Remove, and Dispose of Associated Equipment; and Remove and Dispose of Wooden Structures, Contaminated Soil, and Debris	$867,000	$87,000	$954,000
Alternative 3 – Decontaminate, Remove and Dispose of All Above-Grade Buildings, Associated Equipment, Contaminated Soil, and Debris	$1,104,000	$110,000	$1,214,000

* Ten percent of direct cost.

Section 4

(Table divider sheet and Table 4-1)

4.0 Comparative Analysis of Removal Action Alternatives

4.1 Method of Comparison

The three removal action alternatives were compared to the following criteria: effectiveness, implementability, and total cost. In making these comparisons, conformance of each of the criteria was evaluated with respect to the following removal action objectives discussed in Subsection 2.1:

- Reduce the potential risk to long-term site users to a level deemed acceptable to EPA and TDEC;
- Be technically appropriate and feasible to accomplish using commonly accepted construction practices;
- Minimize, to the extent possible, the volumes of materials that must be removed and landfilled offsite;
- Have a reasonable and acceptable cost;
- Be implemented in an expedited manner to meet BRAC parcel transfer and leasing schedules; and
- Involve minimal post-removal operational, maintenance, and monitoring requirements.

4.2 Comparison of Alternatives

Table 4-1 summarizes the final comparison of alternatives described above. A review of the results of these comparisons provides the following conclusions:

- All alternatives are capable of meeting the risk-based cleanup criteria for the industrial use of the facility.

- All alternatives are capable of removing reasonably accessible contamination from previous industrial activities in Parcels 35 and 28 and for providing acceptable long-term risk to potential receptors. All are capable of leaving minimal residual effects.
- There is a slight decrease in risk and potential for residual effects with Alternatives 2 and 3 because there is a greater potential for removing less-accessible contaminants beneath and within equipment and building components. These decreases, however, are expected to be small if decontamination is adequately done.
- All alternatives are reasonably protective of workers during removal, provided that appropriate levels of protective measures are in place.
- All alternatives are technically appropriate and feasible. Alternatives 2 and 3 represent an incremental level of difficulty with increased scope of work. This added difficulty, however, is well within the limits of normal construction practice.
- All alternatives will generate materials requiring offsite transportation and disposal requirements. Alternative 2 will generate a slightly greater volume of materials requiring transportation and offsite disposal than will Alternative 1. Alternative 3 will generate a significantly greater volume.
- A substantial portion of the additional disposal requirements for Alternative 2 may be mitigated by a potential for recycling metal materials at a local scrap yard. Similar disposition of metal materials in Alternative 3 is also possible; however, the volume of additional waste materials represented by recycling is substantially smaller due to the construction of the buildings.
- All alternatives can be implemented in less than a 6-month period. The progressively increased scopes from Alternatives 1 through 3 would suggest progressively longer implementation times. However, there may not be a major difference, depending upon the methods and sequencing of the particular contractor.
- None of the alternatives contain treatment, containment, or other components that depend upon controls or maintenance requirements for long-term effectiveness.

- Alternative 1 is the least cost option. Alternative 2 has a slightly greater cost due to requirements for removing and disposing of equipment in the buildings. Alternative 3 has a significantly greater cost.

4.3 Summary

All removal action alternatives can be implemented and all can meet the stated removal action goals. There is a potential for slightly increased effectiveness with Alternatives 2 and 3, but this potential requires progressively increased work scope, disposal requirements, and cost. Final selection, therefore, is essentially a function of intended use requirements of the facilities and cost.

Tables

Table 4-1
Final Comparison of Alternatives

Alternative	Effectiveness	Implementability	Total Cost
Alternative 1 – Decontaminate Existing Metal and Masonry Buildings and Associated Equipment; Remove and Dispose of Wooden Structures, Contaminated Soil, and Debris	Meets risk-based cleanup criteria. Minimum short-term risk and reasonable long-term risk by removing accessible contaminants. Minimal residual effects.	Is technically appropriate and feasible. Short duration, moderate difficulty. Minimal offsite effects, mainly traffic. Minimum waste generation. Local disposal capacity available. No controls or maintenance	Lowest cost alternative. Estimated comparative cost of: $944,000
Alternative 2 – Decontaminate Existing Metal and Masonry Buildings, Decontaminate, Remove, and Dispose of Associated Equipment; and Remove and Dispose of Wooden Structures, Contaminated Soil, and Debris	Meets risk-based cleanup criteria. Slightly increased short-term risk and slightly decreased long-term risk by removing less-accessible contaminants beneath equipment. Minimal residual effects.	Is technically appropriate and feasible. Slightly greater duration, difficulty, and offsite traffic. Greater waste volume Local disposal capacity available. No controls or maintenance.	Greater cost due to equipment removal and disposal requirements. Estimated comparative cost of: $954,000
Alternative 3 – Decontaminate, Remove and Dispose of All Above-Grade Buildings, Associated Equipment, Contaminated Soil, and Debris	Meets risk-based cleanup criteria. Slightly increased short-term risk and least long-term risk by removing potential above-grade contaminants. Minimal residual effects.	Is technically appropriate and feasible. Greater duration, difficulty, and offsite traffic. High waste volume. Local disposal capacity available. No controls or maintenance.	Highest cost due to extensive structural removal. Estimated comparative cost of: $1,214,000

5.0 Recommended Removal Alternative

On the basis of final evaluations discussed in the previous section and information derived throughout this EE/CA document, we make the following recommendations:

- Alternative 2 is recommended as the primary alternative for removal actions in Parcels 35 and 28. This alternative would provide, at a reasonable cost, open and fully decontaminated buildings that could be used for a variety of purposes. By removing the sandblast and paint booth equipment, the potential for recontaminating the area by similar future operations is minimized.
- Alternative 1 should be considered if the proposed future use is similar to the past use and requires the equipment to remain in place. If Alternative 1 is selected, it is recommended that the future tenant be required to accept any future risk and costs associated with inaccessible contamination that might be located during any future equipment removals and/or any contamination associated with future of the area.
- Alternative 3 is not recommended. Added benefits of removing the buildings do not appear to justify the high cost for such work.

6.0 References

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8. CH2M HILL. *Groundwater Monitoring Report.* March 1998.

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10. Pickering Firm, Inc. Asbestos Identification Survey. Defense Distribution Depot Memphis, Tennessee. March 1994.

11. CH2M HILL. *Final Groundwater Characterization Data Report*. August 1997.

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Appendix
Cost Estimate

Supporting Data

Summary of Quantities

Parcel 35 and 28 Remediation

Defense Depot Memphis, Tennessee

Alternative 1 – Decontaminate Existing Metal and Masonry Buildings and Associated Equipment for In-Place BRAC Transfer, Remove and Disp;ose of Wooden Structures, Contaminated Soil, and Debris.

Mobilize and Preparatory Work

- Mobilize Construction Equipment
    - Assume 3 month duration of work
    - Assume trailer and portable toilets for duration.
    - Project within DDMT – No security guard required.
- Pre-Construction Submittals (assume similar to those for Housing Area Soil Removal)
    - Assume level is 1.5 times that of the Housing Area Soil Removal

Monitoring, Sampling, and Testing

- TCLP Analyses – 4 each
- Random Swipe Samples for metals only (Level 2) – 84 ea. (assume avg. 12 per building)
- Confirmatory Swipe Samples for metals only (Level 3) - 20 (assume 20% of level 2 , plus QC)
- Level 2 Metals and PAH Scan for Soils - 35 each (avg three composite for each current excavation area, plus 2QC samples)
- Level 3 Metals and PAH Confirmation Samples for Soils – 9 each (1 for each 5 Level 2 samples, plus 2 QC samples)
- Level 3 Full Scan (confirm) - 2 each (one at 1084 and 1 at 1085)

Site Work

- Fencing
    - Install and Remove Temporary Chain Link Security Fence (Rent 1 mo.) – 760 linear feet.
    - Install Permanent Double Vehicle Gate with Lock in Existing Fence – 1 each

Building and Equipment Decontamination

- Metal/Fiberglass Sheeting (Vacuum and Wash) - 112,000 square feet
- Metal/Fiberglass Sheeting (Vacuum Only) – 2,000 square feet

- Concrete and Masonry Surfaces – 67,400 square feet (Vacuum and Wash)
- Steel Structural Surfaces – 65,000 (Vacuum and Wash)
- Timber Surfaces – 2,600 square feet (Vacuum Only)
- Metal Piping and Equipment - 2500 square feet (Vacuum and Wash Interior and Exterior Decon)
- 6" Drain Tile (Interior Flush) - 700 linear feet

Assume that vacuuming in dusty areas will be done in Level C protection. All other work will be level D, including washing down areas.

Building and Equipment Demolition

- Remove Corrugated Metal – 50 cubic feet
- Remove Timber Frame – 310 cubic feet
- Remove Fiberglass Sheeting – 29 cubic feet
- Remove Drain Tile – 39 cubic feet
- Remove Asphalt Roof Shingles – 41.7 cubic feet
- Chip and Remove Concrete – 150 cubic feet
- Remove Asbestos Gaskets from Paint Booths – 25 cubic feet
- Remove 500-gallon sand-filled underground storage tank – 1 each

Water Collect and Control

- Silt Fences – 1,500 linear feet
- Collect/Dispose of Contaminated Water – 20,000 gallons (Assuming 1 gallon per 25 sf + additional volume similar to housing area project)

Solids Collect and Contain

- Excavate and Load Contaminated Surface Soil – 1,100 cubic yards
- Excavate and Load Excavations (trench/pit excavation) – 50 cubic yards

Disposal (Commercial)

- Structural Debris (timber, siding, roofing) to Local Industrial Landfill – 20 tons
- Contam Soil to Local Industrial Landfill – 1,150 cubic yards (1,800 tons)
- Concrete/Masonry Debris to Local Landfill – 15 tons
- Contaminated Sweepings to Haz Wste Landfill (w/stab) – 12 cubic yards (15 tons) assuming 6 cy Bldg 1088 and 1 cy other buildings

- Asbestos Disposal to Approved Landfill – 1 cubic yard

Site Restoration

- Granular Backfill – 600 cubic yards
- Gravel Surfacing Material - 500 cubic yards
- Concrete Repairs - 10 cubic yards
- Seeding and Mulching – 20,000 square feet

Demobilization – Use Similar Assumptions as those for Housing Area Remediation

Alternative 2 – Decontaminate Existing Metal and Masonry Buildings for In-Place BRAC Transfer, Decontaminate, Remove, and Dispose of Associated Equipment, and Remove and Dispose of Wooden Structures, Contaminated Soil, and Debris.

Note: All changes from Alternative 1 are Italicized and underlined.

Mobilize and Preparatory Work

- Mobilize Construction Equipment
    - Assume 3 month duration of work
    - Assume trailer and portable toilets for duration.
    - Project within DDMT – No security guard required.
- Pre-Construction Submittals (assume similar to those for Housing Area Soil Removal)
    - Assume level is 1.5 times that of the Housing Area Soil Removal

Monitoring, Sampling, and Testing

- TCLP Analyses – 4 each
- *Random Swipe Samples for metals only (Level 2) – 56 ea. (assume avg. 8 per building)*
- *Confirmatory Swipe Samples for metals only (Level 3) - 14 (assume 20% of level 2 , plus QC)*
- Level 2 Metals and PAH Scan for Soils - 35 each (two composite for each current excavation area, plus 5 additional samples)
- Level 3 Metals and PAH Confirmation Samples for Soils – 9 each (1 for each 5 Level 2 samples, plus 2 QC samples)
- Level 3 Full Scan (confirm) - 2 each (one at 1084 and 1 at 1085)

Site Work

- Fencing
    - Install and Remove Temporary Chain Link Security Fence (Rent 1 mo.) – 760 linear feet
    - Install Permanent Double Vehicle Gate with Lock in Existing Fence – 1 each

Building and Equipment Decontamination

- Metal/Fiberglass Sheeting (Vacuum and Wash) - 112,000 square feet
- Metal/Fiberglass Sheeting (Vacuum Only) – 2,000 square feet
- Concrete and Masonry Surfaces – 67,400 square feet (Vacuum and Wash)
- Steel Structural Surfaces – 65,000 (Vacuum and Wash)
- Timber Surfaces – 2,600 square feet (Vacuum Only)

- Metal Piping and Equipment - 2500 square feet (Vacuum and Wash Interior and Exterior Decon)
- 6" Drain Tile (Interior Flush) - 700 linear feet

Assume that vacuuming in dusty areas will be done in Level C protection. All other work will be level D, including washing down areas.

Building and Equipment Demolition

- Remove Corrugated Metal – 50 cubic feet
- Remove Timber Frame – 310 cubic feet
- Remove Fiberglass Sheeting – 29 cubic feet
- Remove Drain Tile – 39 cubic feet
- Remove Asphalt Roof Shingles – 41.7 cubic feet
- Chip and Remove Concrete – 150 cubic feet
- Remove Asbestos Gaskets from Paint Booths – 25 cubic feet
- Remove 500-gallon sand-filled underground storage tank – 1 each
- *Remove Steel Paint Booths – 3,200 cubic feet (420 tons)*
- *Remove Misc. Equipment and Piping – 200 cubic feet (20 tons)*

Water Collect and Control

- Silt Fences – 1,500 linear feet
- Collect/Dispose of Contaminated Water – 20,000 gallons (Assuming 1 gallon per 25 sf + additional volume similar to housing area project.

Solids Collect and Contain

- Excavate and Load Contaminated Surface Soil – 1,100 cubic yards
- Excavate and Load Excavations (trench/pit excavation) – 50 cubic yards

Disposal (Commercial)

- Structural Debris to Local Industrial Landfill – 20 tons
- Contaminated Soil to Local Industrial Landfill – 1,150 cubic yards (1,800 tons)
- Concrete/Masonry Debris to Local Landfill – 15 tons
- Contaminated Sweepings to Haz Wste Landfill (w/stab) – 12 cubic yards, or 15 tons (assuming 6 cy Bldg 1088, 1 cy avg other buildings)
- Asbestos Disposal to Approved Landfill – 1 cubic yard

- *Dispose of Steel Scrap to Local Scrap Yard – 440 tons*

Site Restoration

- Granular Backfill – 600 cubic yards
- Gravel Surfacing Material – 500 cubic yards
- Concrete Repairs - 10 cubic yards
- Seeding and Mulching – 20,000 square feet

Demobilization- Use Similar Assumptions as those for Housing Area Remediation

Alternative 3 – Decontaminate, Remove, and Dispose of All Above-Grade Buildings and Associated Equipment and Remove andDispose of Contaminated Soil and Debris.

Note: All changes from Alternative 1 are Italicized and underlined.

Mobilize and Preparatory Work

- Mobilize Construction Equipment
  - *Assume 4 month duration of work*
  - Assume trailer and portable toilets for duration.
  - Project within DDMT – No security guard required.
- Pre-Construction Submittals (assume similar to those for Housing Area Soil Removal)
  - Assume level is 1.5 times that of the Housing Area Soil Removal

Monitoring, Sampling, and Testing

- TCLP Analyses – 4 each
- *Random Swipe Samples for metals only (Level 2) – 14 ea. (assume avg. 2 per building)*
- *Confirmatory Swipe Samples for metals only (Level 3) - 4 (assume 20% of level 2 , plus QC)*
- Level 2 Metals Scan for Soils - 35 each (three composite for each current excavation area, plus 2 QC samples)
- Level 3 Metals Confirm for Soils – 9 each (1 for each 5 Level 2 samples, plus 2 QC samples)
- Level 3 Full Scan (confirm) - 2 each (one at 1084 and 1 at 1085)

Site Work

- Fencing
  - Install and Remove Temporary Chain Link Security Fence (Rent 1 mo.) – 760 linear feet.
  - Install Permanent Double Vehicle Gate with Lock in Existing Fence – 1 each

Building and Equipment Decontamination

- Metal/Fiberglass Sheeting (Vacuum and Wash) - 112,000 square feet
- Metal/Fiberglass Sheeting (Vacuum Only) – 2,000 square feet
- *Concrete and Masonry Surfaces – 10,000 square feet (Vacuum Only)*
- *Concrete Surfaces – 58,000 square feet (Vacuum and Wash)*
- Steel Structural Surfaces – 65,000 (Vacuum and Wash)
- Timber Surfaces – 2,600 square feet (Vacuum Only)

- Metal Piping and Equipment - 2500 square feet (Vacuum and Wash Interior and Exterior Decon)
- 6" Drain Tile (Interior Flush) - 700 linear feet

Assume that vacuuming in dusty areas will be done in Level C protection. All other work will be level D, including washing down areas.

Building and Equipment Demolition

- *Remove Corrugated Metal – 3,500 cubic feet*
- *Remove Steel Roof/Column Structures – 12,300 cubic feet*
- Remove Timber Frame – 310 cubic feet
- Remove Fiberglass Sheeting – 29 cubic feet
- Remove Drain Tile – 39 cubic feet
- Remove Asphalt Roof Shingles – 41.7 cubic feet
- *Remove Concrete and Masonry Walls – 11,300 cubic feet (415 cy)*
- Chip and Remove Concrete – 150 cubic feet
- Remove 500-gallon sand-filled underground storage tank – 1 each
- Remove Asbestos Gaskets from Paint Booths – 25 cubic feet
- *Remove Steel Paint Booths – 3,200 cubic feet (420 tons)*
- *Remove Misc. Equipment and Piping – 200 cubic feet (20 tons)*

Water Collect and Control

- Silt Fences – 1,500 linear feet
- Collect/Dispose of Contaminated Water – 20,000 gallons (Assuming 1 gallon per 25 sf + additional volume similar to housing area project.

Solids Collect and Contain

- Excavate and Load Contaminated Surface Soil – 1,100 cubic yards
- Excavate and Load Excavations (trench/pit excavation) – 50 cubic yards

Disposal (Commercial)

- Structural Debris to Local Industrial Landfill - 20 tons
- Contaminated Soil to Local Industrial Landfill – 1,150 cubic yards (1,800 tons)
- *Contam Concrete and Masonry Rubble to Local Industrial Landfill* – 840 tons

- Contaminated Sweepings to Haz Wste Landfill (w/stab) - 12 cubic yards, or 15 tons (assuming 6 cy Bldg 1088, 1 cy avg other buildings)
- Asbestos Disposal to Approved Landfill – 1 cubic yard
- *Dispose of Steel Scrap to Local Scrap Yard – 440 tons*

Site Restoration

- Granular Backfill – 600 cubic yards
- Gravel Surfacing Material – 500 cubic yards
- Concrete Repairs - 10 cubic yards
- Seeding and Mulching – 20,000 square feet

Demobilization – Use Similar Assumptions as those for Housing Area Remediation

SUBJECT [illegible] | SHEET NO. 1 of 1 | DATE 1-20-99
[illegible] | PROJECT NO. 113627.[illegible]

773 116

PURPOSE: MEASURE QUANTITIES OF VARIOUS PROJECT COMPONENTS FOR INPUT INTO PROJECT COST ESTIMATE.

METHOD: DIRECT MEASUREMENT USING "BENTLY MICROSTATION 95" LINEAR & AREA MEASURING UTILITIES.

ASSUMPTIONS: ALL MEASUREMENTS ARE BASED ON MAPPING PROVIDED BY DDMT & DIGITIZED BY CH2M HILL.

QUANTITIES FOR CLEARING ARE ALSO BASED ON ADDITIONAL INFORMATION CONTAINED IN THE VIDEO TAPE PROVIDED BY DDMT.

SUMMARY: AREA A = 57,210 SF (1.31 AC)
AREA B = 15,420 SF (0.35 AC)
AREA C = 41,860 SF (0.96 AC)
CHAINLINK FENCE = 980 LF
SECURITY FENCE = 1750 LF
SILT FENCE = 1750 LF
AREA OF CLEARING - 10,960 SF (0.25 AC)
SOIL AREA = 68,950 SF (7,700 SY)
SOIL CONDITIONING = 72,630 SF (1.67 AC)
MULCH AREA = 3,650 SF

F027 CONT. HI CODE

DIELDRIN

SUBJECT ESTIMATE QTY OF CONTAM WATER BY E.R. UNDERWOOD DATE
FOR ESTIMATE SHEET 1 OF 1
EST. COST/GAL. PROJECT NO 773 117

AREA 1: 57,210 S.F.
AREA 2: 15,420

72,630 S.F.

1/2 AREA OPEN AT ONE TIME: 36,315 SF.

ASSUME 2" RAIN DURING EXCAVATION; 10% PONDS IN EXCAVATION

(36,315)(2/12) (7.48 GAL/C.F.)(0.10) = 4,527 GAL.

DECON WATER (ASSUME 500 GAL.)

TOTAL = 4,527
+ 500

5,527 GAL (USE 5,000 GAL FOR EST.)

WELL WORK BY CH2M HILL IN 1995 REQUIRED CONTAINERIZATION, TESTING, AND DISPOSAL OF WATER AT AN OFF-SITE TREATMENT FACILITY. FOR 600 GAL, THE COST WAS #450 PER G. UNDERBERG/OKO.

UNIT COST FOR OFF-SITE DISPOSAL = 600 GAL / $450/GAL = 0.75/GA.

AREA A: (1) EXCAVATE 6", DO LEVEL 2 SAMPLING @ 1 SAMPLE PER 2,500 S.F
DO 10% LEVEL 3 DIELDRIN CONFIRMS

AREA = 57210

LEVEL 2 SAMPLES = $\frac{57210}{2500}$ = 23 SAMPLES

LEVEL 3 CONFIRMS = 23(0.1) = 2.3 ⇒ 3 SAMPLES

(2) EXCAVATE 6", DO LEVEL 3 SCAN @ 1 SAMPLE / 10,000 SF

$\frac{57,210}{10,000}$ = 5.72 SAMPLES ⇒ 6 SAMPLES

AREA B (1) DO LEVEL 2 SAMPLES @ SURFACE @ 1 SAMPLE PER 2,500 S.F

AREA = 15,420 SF

LEVEL 2 SAMPLES = $\frac{15,420}{2,500}$ = 6.16 ⇒ 7 SAMPLES

LEVEL 3 CONFIRMS = 10% = 7(.1) = 0.7 ⇒ 1 SAMPLE

(2) EXCAVATE 6", DO LEVEL 2 SAMPLING

LEVEL SAMPLES (SAME AS (1)) = 7 SAMPLES

LEVEL 3 CONFIRMS (SAME AS (1)) 1 SAMPLE

(3) DO LEVEL 3 FULL SCAN @ 1 / 10,000 SF.

$\frac{15,420 \text{ SF}}{10,000 \text{ SF}}$ = 1.54 ⇒ 2 SAMPLES

AREA C: (1) DO LEVEL 2 SAMPLES @ SURFACE @ 1 SAMPLE / 2,500 SF

AREA = 41,860 SF

LEVEL 2 = $\frac{41,860}{2,500}$ = 16.74 ⇒ 17 SAMPLES

LEVEL 3 CONFIRMS = 10% = 17(.1) = 1.7 ⇒ 2 SAMPLES

(2) DO FULL-SCAN LEVEL #3 SAMPLES 1 @ 10,000 SF

$\frac{41,860}{10,000}$ = 4.19 ⇒ 5 SAMPLES

	AREA A	AREA B	AREA C	TOTAL
LEVEL 2 (DIELDRIN)	23	14	17	54
LEVEL 3 (DIELDRIN)	3	2	2	7
LEVEL 3 (FULL SCAN)	6	2	5	12

SUBJECT ESTIMATE ANALYTICAL REQ'MTS/COSTS BY E R UNDERWOOD DATE 1/21/98
DDMT SOIL REMOVAL SHEET 2 OF 2
PROJECT NO 113627.CP.22

LEVEL 3 REQUIRES 20% ADDITIONAL NUMBER FOR DUPLICATES, LAB BLANKS, ETC. REQ'D FOR VALIDATION

REVISED SUMMARY of QTYS

LEVEL 2 (DIELDRIN): 54 ea
LEVEL 3 (DIELDRIN): 7(1.2) = 8.4 ⇒ 9 EA.
LEVEL 3 (FULL SCAN): 12(1.2) = 14.4 ⇒ 15 EA.

LAB COSTS (CH2M HILL LAB QUOTES)

LEVEL 2 (DIELDRIN): $ 90.00 ($75 + 15 FOR DATA MGMT.)
LEVEL 3 (DIELDRIN): $ 170.53 SEE ATTACHED
LEVEL 3 (FULL SCAN): $1,060.76 SEE ATTACHED

LEVEL 3 DATA MGMT: $3084 SEE ATTACHED
LEVEL 3 DATA REPT.: 2163
$5,247

TOTAL # LEVEL 3 SAMPLES: 24

DATA MGMT/RPT COST = $5247 / 24 = $218.62/SAMPLE

SUMMARY OF ANALYTICAL COSTS

LEVEL 2 (DIELDRIN) $ 90.00 EA
LEVEL 3 (DIELDRIN) $ 170.53 + $218.62 = $389.15
LEVEL 3 (FULL SCAN) $1060.76 + $218.62 = $1279.38

SUBJECT BACKFILL / TOPSOIL UNIT COST ADD-ON FOR ANALYTICAL TESTING
BY E. R. UNDERWOOD DATE 1/21/98
SHEET 1 OF 1
PROJECT NO 113627.C9.ZZ

WE SPECIFY 1 LEVEL 3 FULL-SCAN ANALYSIS PER 1000 CY OF IMPORTED MTLS, OR PART THEREOF. PER ESTIMATING ASSUMPTIONS WE WILL HAVE 1050 CY OF GENERAL BACKFILL AND 1350 CY OF TOPSOIL. SINCE BOTH ARE ABOVE 1000 CY, 2 TESTS ARE REQUIRED. AT $1280/TEST (PER ONSITE ANALYTICAL COSTS FOR FULL-SCAN LEVEL 3 ANALYSIS), THE FOLLOWING ANALYTICAL COST ADD-ONS TO THE INSTALLED UNIT COSTS INCLUDE:

GENERAL BACKFILL $\frac{\$1280(2)}{1050\,CY} = \$2.43/CY$

TOPSOIL $\frac{\$1280(2)}{1350\,CY} = \$1.89/CY$

Underwood, Edward/WDC

From: Underberg, Greg/ORO
Sent: Wednesday, January 21, 1998 10:40 AM
To: Underwood, Edward/WDC
Subject: FW: Costs

Importance: High

Randy,

I filled this out. Look at the whole thing, some of it is updated and not in "blue" font.

Greg Underberg
(423) 483-9005 x543
(423) 481-3541 fax
gunderbe@ch2m.com

-----Original Message-----
From: Underberg, Greg/ORO
Sent: Tuesday, January 20, 1998 5:08 PM
To: Underwood, Edward/WDC
Subject: Costs

Level III analyses:

Pesticides for Dieldrin confirmation (8080)- 144.32
Electronic deliverable 7.21
Data Validation 19.00
Sample Total 170.53

Full list for composite sampling:
Pesticides/PCBs (8080) - 166.87
PNA (8100 mod - SVOA) - 180.40
Volatiles (8260)- 202.95
TAL Metals 273.11
ICP Metals 72.16
Cyanide 45.23
Per Sample Subtotal 940.720
Electronic deliverable 47.04
Data Validation 73.00
Per Sample Total 1,060.76

Other Lump Sum cost --

1) Data Management:
35 hrs x $52/hr ES02 = 1,820
16 hrs x $79.hr ES06 = 1,264
Total Data Manage. 3,084

2) Data Quality Evaluation Report
8 hrs x $52/hr ES02 = 416
4 hrs x $12/hr temp labor = 48
24 hrs x $72.80 = 1,747.20
DQE Total = $2,163.20

Waste Water Management: Assumes that the water is nonhazardous and can be trucked via sewer hauler to the City of Memphis Sewer.

Line items -

Cost of 1 TCL/TAL Sample = 1,060.76
Poly Tank Rental - $270/month based on 1995 work.
Transport to sewer and tank cleanout: $450 based on subcontractor estimate in 1995.

I'll send analytical charges and TCLP tomorrow. This isn't complete yet.

Greg Underberg
(423) 483-9005 x543
(423) 481-3541 fax
gunderbe@ch2m.com

CH2M HILL TELEPHONE CONVERSATION RECORD

CALL TO: Spencer Hamill
CH2M HILL Analytical Laboratory,
Montgomery, AL

PHONE NO.: 334-271-1444

DATE: 01/21/98

CALL FROM: Randy Underwood

TIME: 12:00PM

MESSAGE TAKEN BY: Edward R. Underwood/WDC

PROJECT NO.: 113627.CP.ZZ

SUBJECT: Quotes for TCLP analysis of soil

I indicated that we specify the contractor to run a minimum of two TLCP analyses to determine if the excavated soil is hazardous. This is will determine the disposal requirements. Mr. Hamill indicated that the current rate for a full TCLP analysis for soil (VOA, SVOA, metals, pesticides, and herbicides) is $1130.

CH2M HILL TELEPHONE CONVERSATION RECORD

CALL TO: Shana Smiley
Shana Smiley
BFI

Shana Smiley
BFI, 5497 Malone Road, Memphis, TN

PHONE NO.: (901) 872-7200

DATE: 01/19/98

CALL FROM: Randy Underwood / WDC

TIME: 2:30PM

MESSAGE TAKEN BY: Edward R. Underwood/WDC

PROJECT NO.: 113627.CP.ZZ

SUBJECT: Costs for Disposal of Contaminated Soil at the BFI Special Waste Landfill

I explained that we would be excavating about 2,300 cubic yards of soil contaminated with dieldrin and would like to landfill it locally if possible. Ms. Smiley indicated that the BFI landfill can accept the waste, provided that the concentrations of pesticides are below regulatory limits as established by the TCLP test.

The current charge of disposing of contaminated soil at their landfill is:

- $20 per ton for volumes up to 2,000 cubic yards;
- $19 per ton for volumes above 2,000 cubic yards; and
- potential further decreases with additional volume (generally in increments of 2,000 cubic yards)

The quoted figures include all state taxes and surcharges.

I asked if the facility could also accept debris from clearing (e.g. shrubs, vegetation, etc.). Ms. Smiley indicated that they could and that the current charge for disposing of these wastes is $6 per cubic yard, plus a state surcharge of $0.80 per ton.

The landfill facility is approximately 10 miles from the DDMT facility.

CH2M HILL TELEPHONE CONVERSATION RECORD

CALL TO: Roger Green
Giaroli Nursery & Landscaping,
Memphis, TN

PHONE NO.: (901) 382-5402 **DATE:** 01/19/98

CALL FROM: Randy Underwood/WDC **TIME:** 3:30PM

MESSAGE TAKEN BY: Edward R. Underwood/WDC **PROJECT NO.:** 113627.CP.ZZ

SUBJECT: Landscaping Materials Costs

Mr. Green indicated that they sell topsoil, sod, mulch, and the plants we are looking for. Current material prices are as follows:

- Topsoil - $15 per cubic yard; however there could be some discount with the quantities (e.g. over 1,000 cy) for this project.
- Sod - Typical sod used in the area for athletic fields, etc., is a Hybrid Bermuda Grass mix. It sells for $100 per 50 square yard pallet. A heavier duty sod, which is used in really high traffic areas is the Zoyia Sod which sells for $140 per 40 square yard pallet.
- Mulch - They do not carry Cyprus bark mulch. Their mulch is shredded hardwood mulch and sells for $15 per cubic yard.
- Plants are as follows:
    - Red Tip Photena (5-gallon size): $23.98 ea.
    - American Holly (5-gallon size): $23.98 ea.
    - Azalea (5-gallon size): $24.98 ea.
    - Variegated Monkey Grass (4-inch pot): $25.00 per 18-pot flat.

He indicated that they do landscaping work and can install the materials for a contractor. However, he did not have the current installation rates for the installation side of the business.

Alternati[illegible] 2
Decontamina[illegible]n Quantities

Bldg. #	Concrete (sqft)	Masonry (sqft)	Corr. Metal (sqft)	Lumber (sqft)	Fiberglass Sheeting (sqft)	Steel Roof Trusses (sqft)	Steel Roof Purlins (sqft)	Steel Column (sqft)	Steel Paint Booth (sqft)	Steel Blast Booth (sqft)	Drain Tile (ft)	Steel Tendons (ft)	Equip (sqft)	Asbestos (sqft)	Metal Piping (sqft)
1084	1220	N/A	1000	2523	700	N/A	N/A	N/A	N/A	N/A	296	N/A	N/A	N/A	N/A
1086	10081	5449	14187	N/A	N/A	3190	7230	2080	8400	N/A	390	N/A	774	N/A	N/A
1087	6721	N/A	11627	N/A	N/A	1530	3444	1105	17120	N/A	?	624	648	N/A	N/A
1088	860	N/A	2102	N/A	N/A	256	570	185	N/A	5032	N/A	N/A	812	N/A	242
1089	42990	N/A	52440	N/A	N/A	14008	11880	13360	N/A	N/A	N/A	5180	N/A	N/A	N/A
	Σ= 61872	Σ= 5449	Σ= 81356	Σ= 2523	Σ= 700	Σ= 18984	Σ= 23124	Σ= 16730	Σ= 25520	Σ= 5032	Σ= 686	Σ= 5804	Σ= 2234	Σ=	Σ= 242

Total area for decontamination = 184686 sqft

+ 20546 ft of metal truss/purlin/column material = 58838 sqft

+ 186 ft of metal piping = 242 sqft

+ 5804 ft of metal tendons

+ 686 ft of drain tile

Alter[illegible]e 1
Quantities for M[illegible]erial Disposal
(Only includes above ground structure components)

Bldg. #	Concrete (ft^3)	Masonry (ft^3)	Corr. Metal (ft^3)	Lumber (ft^3)	Fiberglass Sheeting (ft^3)	Steel Roof Trusses (ft)	Steel Roof Purlins (ft)	Steel Column (ft)	Steel Paint Booth (ft^3)	Steel Blast Booth (ft^3)	Drain Tile (ft^3)	Steel Tendons (ft^3)	Equip (ft^3)	Asbestos (ft^3)	Metal Piping (ft)
1084	100	N/A	42	310	29	N/A	N/A	N/A	N/A	N/A	39	N/A	N/A	N/A	N/A
1086	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1087	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1088	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1089	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Σ=100	Σ=	Σ=42	Σ=310	Σ=29	Σ=	Σ=	Σ=	Σ=	Σ=	Σ=39	Σ=	Σ=	Σ-	Σ

Total volume for disposal = <u>520 ft^3</u>

+ 8+ ft^3 of potentially contaminated sand and gravel in sump pit in Bldg 1084

+ 41.7 ft^3 of asphalt roof shingles on Bldg 1084

773 128

Alter[illegible]e 1

Tonnages for Material Disposal

(Only includes above ground structure components)

Bldg. #	Concrete (tons)	Masonry (tons)	Corr. Metal (tons)	Lumber (tons)	Fiberglass Sheeting (tons)	Steel Roof Trusses (tons)	Steel Roof Purlins (tons)	Steel Column (tons)	Steel Paint Booth (tons)	Steel Blast Booth (tons)	Drain Tile (tons)	Steel Tendons (tons)	Equip (tons)	Asbestos (tons)	Metal Piping (tons)
1084	7.5	N/A	10.3	4.7	0.4	N/A	N/A	N/A	N/A	N/A	2.9	N/A	N/A	N/A	N/A
1086	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1087	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1088	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1089	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Σ=7.5	Σ=	Σ=10.3	Σ=4.7	Σ=0.4	Σ=	Σ=	Σ=	Σ=	Σ=	Σ=2.9	Σ=	Σ=	Σ=	Σ=

Total tonnage for disposal = <u>25.8 tons</u>

+ 8+ ft^3 of potentially contaminated sand and gravel in sump pit in Bldg 1084

+ 1.9 tons of asphalt roofing shingles on Bldg 1084

Alternati ② Decontamina Quantities

Bldg. #	Concrete (sqft)	Masonry (sqft)	Corr. Metal (sqft)	Lumber (sqft)	Fiberglass Sheeting (sqft)	Steel Roof Trusses (sqft)	Steel Roof Purlins (sqft)	Steel Column (sqft)	Steel Paint Booth (sqft)	Steel Blast Booth (sqft)	Drain Tile (ft)	Steel Tendons (ft)	Equip (sqft)	Asbestos (sqft)	Metal Piping (sqft)
1084	1220	N/A	1000	2523	700	N/A	N/A	N/A	N/A	N/A	296	N/A	N/A	N/A	N/A
1086	10081	5449	14187	N/A	N/A	3190	7230	2080	8400	N/A	390	N/A	774	N/A	N/A
1087	6721	N/A	11627	N/A	N/A	1530	3444	1105	17120	N/A	?	624	648	N/A	N/A
1088	860	N/A	2102	N/A	N/A	256	570	185	N/A	5032	N/A	N/A	812	N/A	242
1089	42990	N/A	52440	N/A	N/A	14008	11880	13360	N/A	N/A	N/A	5180	N/A	N/A	N/A
	Σ= 61872	Σ= 5449	Σ= 81356	Σ= 2523	Σ= 700	Σ= 18984	Σ= 23124	Σ= 16730	Σ= 25520	Σ= 5032	Σ= 686	Σ= 5804	Σ= 2234	Σ=	Σ= 242

Total area for decontamination = 184686 sqft

+ 20546 ft of metal truss/purlin/column material = 58838 sqft

+ 186 ft of metal piping = 242 sqft

+ 5804 ft of metal tendons

+ 686 ft of drain tile

Altern[illegible]e 2
Quantities for Material Disposal
(Only includes above ground structure components)

Bldg. #	Concrete (ft³)	Masonry (ft³)	Corr. Metal (ft³)	Lumber (ft³)	Fiberglass Sheeting (ft³)	Steel Roof Trusses (ft)	Steel Roof Purlins (ft)	Steel Column (ft)	Steel Paint Booth (ft³)	Steel Blast Booth (ft³)	Drain Tile (ft³)	Steel Tendons (ft³)	Equip (ft³)	Asbestos (ft³)	Metal Piping (ft)
1084	100	N/A	42	310	29	N/A	N/A	N/A	N/A	N/A	39	N/A	N/A	N/A	N/A
1086	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1050	N/A	N/A	N/A	N/A	5.1	N/A
1087	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2140	N/A	N/A	N/A	N/A	13.3	N/A
1088	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	~~N/A~~ 157	N/A	N/A	~~N/A~~ 25	N/A	N/A
1089	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Σ=100	Σ=	Σ=42	Σ=310	Σ=29	Σ=	Σ=	Σ=	Σ=3190	Σ=157	Σ=39	Σ=	Σ=25	Σ=18.4	Σ=

Total volume for disposal = <u>3710 ft³</u>

+ 8+ ft^3 of potentially contaminated sand and gravel in sump pit in Bldg 1084

+ 41.7 ft^3 of asphalt roof shingles on Bldg 1084

+ 18.4 ft^3 of asbestos from door seals

773 130

Altern[illegible]e 2
Tonnages for Material Disposal
(Only includes above ground structure components)

Bldg. #	Concrete (tons)	Masonry (tons)	Corr. Metal (tons)	Lumber (tons)	Fiberglass Sheeting (tons)	Steel Roof Trusses (tons)	Steel Roof Purlins (tons)	Steel Column (tons)	Steel Paint Booth (tons)	Steel Blast Booth (tons)	Drain Tile (tons)	Steel Tendons (tons)	Equip (tons)	Asbestos (tons)	Metal Piping (tons)
1084	7.5	N/A	10.3	4.7	0.4	N/A	N/A	N/A	N/A	N/A	2.9	N/A	N/A	N/A	N/A
1086	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	257	N/A	N/A	N/A	N/A	?	N/A
1087	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	161	N/A	N/A	N/A	N/A	?	N/A
1088	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	~~N/A~~ [illegible]	N/A	N/A	~~N/A~~ [illegible]	N/A	N/A
1089	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Σ=7.5	Σ=	Σ=10.3	Σ=4.7	Σ=0.4	Σ=	Σ=	Σ=	Σ=418	Σ= 11.8	Σ=2.9	Σ=	Σ=1.9	Σ=?	Σ

Total tonnage for disposal = 443.8 tons

+ 8+ ft^3 of potentially contaminated sand and gravel in sump pit in Bldg 1084

+ 1.9 tons of asphalt roofing shingles on Bldg 1084

Alternati[illegible], & (3)
Decontamin[illegible] Quantities

Bldg. #	Concrete (sqft)	Masonry (sqft)	Corr. Metal (sqft)	Lumber (sqft)	Fiberglass Sheeting (sqft)	Steel Roof Trusses (sqft)	Steel Roof Purlins (sqft)	Steel Column (sqft)	Steel Paint Booth (sqft)	Steel Blast Booth (sqft)	Drain Tile (ft)	Steel Tendons (ft)	Equip (sqft)	Asbestos (sqft)	Metal Piping (sqft)
1084	1220	N/A	1000	2523	700	N/A	N/A	N/A	N/A	N/A	296	N/A	N/A	N/A	N/A
1086	10081	5449	14187	N/A	N/A	3190	7230	2080	8400	N/A	390	N/A	774	N/A	N/A
1087	6721	N/A	11627	N/A	N/A	1530	3444	1105	17120	N/A	?	624	648	N/A	N/A
1088	860	N/A	2102	N/A	N/A	256	570	185	N/A	5032	N/A	N/A	812	N/A	242
1089	42990	N/A	52440	N/A	N/A	14008	11880	13360	N/A	N/A	N/A	5180	N/A	N/A	N/A
	Σ= 61872	Σ= 5449	Σ= 81356	Σ= 2523	Σ= 700	Σ= 18984	Σ= 23124	Σ= 16730	Σ= 25520	Σ= 5032	Σ= 686	Σ= 5804	Σ= 2234	Σ=	Σ= 242

Total area for decontamination = 184686 sqft

+ 20546 ft of metal truss/purlin/column material = 58838 sqft

+ 186 ft of metal piping = 242 sqft

+ 5804 ft of metal tendons

+ 686 ft of drain tile

773 132

Altern 3
Quantities for Material Disposal
(Only includes above ground structure components)

Bldg. #	Concrete (ft^3)	Masonry (ft^3)	Corr. Metal (ft^3)	Lumber (ft^3)	Fiberglass Sheeting (ft^3)	Steel Roof Trusses (ft)	Steel Roof Purlins (ft)	Steel Column (ft)	Steel Paint Booth (ft^3)	Steel Blast Booth (ft^3)	Drain Tile (ft^3)	Steel Tendons (ft^3)	Equip (ft^3)	Asbestos (ft^3)	Metal Piping (ft)
1084	100	N/A	42	310	29	N/A	N/A	N/A	N/A	N/A	39	N/A	N/A	N/A	N/A
1086	N/A	5449	591	N/A	N/A	1595	2410	416	1050	N/A	51	N/A	N/A	5.1	N/A
1087	3588	N/A	484	N/A	N/A	1626	1148	221	2140	N/A	N/A	4	N/A	13.3	N/A
1088	N/A	N/A	154	N/A	N/A	255	382	74	N/A	157	N/A	N/A	25	5.8	186
1089	2069	N/A	2185	N/A	N/A	7004	3960	2672	N/A	N/A	N/A	16	N/A	N/A	N/A
	Σ=5757	Σ=5449	Σ=3456	Σ=310	Σ=29	Σ=10480	Σ=7900	Σ=3383	Σ=3190	Σ=157	Σ=90	Σ=20	Σ=25	Σ=24.2	Σ=186

Total volume for disposal = 18483 ft^3

+ 8+ ft^3 of potentially contaminated sand and gravel in sump pit in Bldg 1084

+ 186 ft of steel 5"dia. piping

+ 10480 ft of steel roof truss mat'l

+ 7900 ft of steel roof purlin mat'l

+ 3383 ft of steel column mat'l

+ 41.7 ft^3 of asphalt roof shingles on Bldg 1084

+ 24.2 ft^3 of asbestos from door seals

Alter[illegible]e 3
Tonnages for Material Disposal
(Only includes above ground structure components)

Bldg. #	Concrete (tons)	Masonry (tons)	Corr. Metal (tons)	Lumber (tons)	Fiberglass Sheeting (tons)	Steel Roof Trusses (tons)	Steel Roof Purlins (tons)	Steel Column (tons)	Steel Paint Booth (tons)	Steel Blast Booth (tons)	Drain Tile (tons)	Steel Tendons (tons)	Equip (tons)	Asbestos (tons)	Metal Piping (tons)
1084	7.5	N/A	10.3	4.7	0.4	N/A	N/A	N/A	N/A	N/A	2.9	N/A	N/A	N/A	N/A
1086	N/A	409	145	N/A	N/A	10	18	9	257	N/A	3.8	N/A	N/A	?	N/A
1087	269	N/A	36.3	N/A	N/A	4.9	8.6	4.6	161	N/A	N/A	0.3	N/A	?	N/A
1088	N/A	N/A	11.6	N/A	N/A	1.7	2.9	1.6	N/A	11.8	N/A	N/A	1.9	?	0.4
1089	155	N/A	535	N/A	N/A	45.5	29.7	80.5	N/A	N/A	N/A	1.2	N/A	N/A	N/A
	Σ=431.5	Σ=409	Σ=1065	Σ=4.7	Σ=0.4	Σ=62.1	Σ=59.2	Σ=95.7	Σ=418	Σ=11.8	Σ=6.7	Σ=1.5	Σ=1.9	Σ=?	Σ=0.4

Total tonnage for disposal = <u>2568 tons</u>

+ 8+ ft^3 of potentially contaminated sand and gravel in sump pit in Bldg 1084

+ 1.9 tons of asphalt roofing shingles on Bldg 1084

773 134

CH2MHILL SUBJECT Excavation/Backfil Quantities BY

SHEET NO ___ of ___ DATE

PROJECT NO

773 135

BUILDING 1084

EXCAV	4' x 6' x 6' ÷ 27 =	6 cy
GRAN BACKFILL	4 x 6 x 5 ÷ 27 =	5 cy
CONCR BACKFILL	4 x 6 x 1 ÷ 27 =	1 cy

BUILDING 1085

6' x 6' x 8' ÷ 27 = 11 cy
12' x 10' x 8' ÷ 27 = 35 cy
46 cy

Gravel Backfill = [(6x6x1) + (12x10x1)] ÷ 27 = 6 cy.
Granular Backfill = 40 cy.

SURFACE SOIL EXCAV OUTSIDE FENCE
(TO RESIDENTIAL STDS)

A_1 = 70 x 130 x 1 ÷ 27 = 337 cy

A_2 = 50 x 120 x 1 ÷ 27 = 222 cy
560 cy

BACKFILL = 560 cy GRAN. CLEAN SOIL

AREA = 15,100 SF OF SEEDING (1.25) =

SURFACE SOIL INSIDE FENCE
(TO INDUSTRIAL STDS)

①	60 x 20 x 1 ÷ 27	45 cy
②	30 x 15 x 1 ÷ 27	17 cy
③	50 x 30 ÷ 27	56 cy
④	50 x 35 ÷ 27	65 cy
⑤	40 x 20 ÷ 27	30 cy
⑥	60 x 30 ÷ 27	67 cy
⑦	35 x 30 ÷ 27	39 cy
⑧	85 x 25 ÷ 27	79 cy
⑨	70 x 40 ÷ 27	104 cy
		502 cy

Σ Excav

560
+ 502
1062 (Say 1100)

Gran Backfill
5 cy
40 cy
560 cy

CH2MHILL TELEPHONE CONVERSATION RECORD

Call To: Scott Vozza/NJO

Phone No.: NJO Office **Date:** January 20, 1999

Call From: R. Underwood/WDC **Time:** 10:13 PM

Message Taken By: Randy Underwood/WDC

Subject: Current Analytical Costs

I contacted Scott about the current costs of chemical analysis for various tests we anticipate at Parcels 35 and 28. He provided cost information from a price list of Lancaster Laboratories, Lancaster, PA, a reputable full-service laboratory.

TCLP Analysis - $1,363 each

Priority Pollutant Metals and PAH (EPA 846, Meth 8310) - $225 + $236 = $461 each

Priority Pollutant Metals - $ 236 each

Full Scan (Volatiles, acid base neutrals, pest/PCB, TAL Metals, Cyanide, Phenols, Diox) - $1,596 each

Individual metals about $18 each.

According to Lancaster, a Level 3 data package is an additional 8%.

Summary –

- **TCLP - $1,363 each** SAY $1,400
- **Level 2 Priority Pollutant Metals Swipe - $236 each** SAY $250
- **Level 3 Priority Pollutant Metals Swipe - $255 each** SAY $275
- **Level 2 Priority Pollutant Metals and PAH - $461 each** SAY $475
- **Level 3 Priority Pollutant Metals and PAH - $498 each** SAY $500
- **Level 3 Full Scan (Confirm) - $1,723 each** SAY $1,800

CH2MHILL TELEPHONE CONVERSATION RECORD

Call To:	Waste Management Dave Kraus		
Phone No.:	(877) 989-2783	**Date:**	January 26, 1999
Call From:	Mike Robey/GNV	**Time:**	03:53 PM
Message Taken By:	Mike Robey/GNV		
Subject:	Hazardous Waste Disposal		

I talked to Dave Kraus regarding the hauling and disposal of hazardous waste material for the Parcel 35 & 28 Remediation Project. The following are the costs quoted for this work.

Hauling:	$650.00 per 20 ton load from Memphis, TN to facility at Emelle, AL in closed roll-off type container.
Disposal:	$195.00 per ton
Taxes:	$113.00 per ton
Application Fees:	$100.00 flat fee for Alabama state application
	$150.00 flat fee for Emelle application

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ADMINISTRATIVE RECORD

FINAL PAGE