

Final

Site Investigation Report
Motor Pool Area 1300, Parcel 143(7)

Fort McClellan
Calhoun County, Alabama

Prepared for:

U.S. Army Corps of Engineers, Mobile District
109 St. Joseph Street
Mobile, Alabama 36602

Prepared by:

IT Corporation
312 Directors Drive
Knoxville, Tennessee 37923

Task Order CK05
Contract No. DACA21-96-D-0018
IT Project No. 774645

March 2001

Revision 0

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List of Acronyms

See Attachment 1 – List of Abbreviations and Acronyms.

Executive Summary

In accordance with Contract Number DACA21-96-D-0018, Task Order CK05, IT Corporation completed a site investigation (SI) at Motor Pool Area 1300, Parcel 143(7), at Fort McClellan, in Calhoun County, Alabama. The SI was conducted to determine whether chemical constituents are present at the site and, if present, whether the concentrations present an unacceptable risk to human health or the environment. The SI at Motor Pool Area 1300, Parcel 143(7), consisted of the sampling and analysis of seven surface soil samples, seven subsurface soil samples, one depositional soil sample, and five groundwater samples. In addition, five temporary groundwater monitoring wells were installed in the residuum groundwater zone to facilitate groundwater sample collection and to provide site-specific geological and hydrogeological characterization information.

The analytical results from the SI indicate that metals, volatile organic compounds, and semivolatile organic compounds were detected in the various environmental media sampled. To evaluate whether detected constituents present an unacceptable risk to human health or the environment, the analytical results were compared to human health site-specific screening levels (SSSL), ecological screening values (ESV), and background screening values for Fort McClellan.

Although the parcel is projected to be transferred to the Alabama National Guard, the analytical data were screened against residential human health SSSLs to evaluate the site for possible unrestricted future use. In soils, the concentrations of five metals (aluminum, arsenic, chromium, iron, and manganese) exceeded SSSLs. However, with the exception of iron in one subsurface soil sample, the concentrations of these metals were below their respective background concentrations and/or within the range of background values. The concentration of the semivolatile organic compound benzo(a)pyrene (0.098 milligrams per kilogram) marginally exceeded the SSSL (0.085 milligrams per kilogram) in one surface soil sample but was below its background screening value. In groundwater, the concentrations of aluminum, barium, and iron exceeded SSSLs and the respective background concentrations. However, the concentrations of these metals were within the range of background values. In addition, the concentration of chloroform (0.0013 milligrams per liter) marginally exceeded the SSSL (0.00115 milligrams per liter) in one groundwater sample. Given the low concentrations and limited distribution, the metals and organic constituents detected in site media do not pose an unacceptable risk to human health.

Mercury and zinc were detected in one surface soil sample each at concentrations exceeding their respective ESVs and the range of background values. However, the potential impact to ecological receptors is expected to be minimal, based on the existing viable habitat and site conditions. The fenced site is located in a well-developed area consisting of buildings, pavement, and gravel, interspersed with minimal grassy areas. The site is projected for future use by the Alabama National Guard. Viable ecological habitat is presently limited and is not expected to increase in the future land-use scenario. Consequently, the potential threat to ecological receptors is expected to be low.

Based on the results of the SI, past operations at Motor Pool Area 1300, Parcel 143(7), do not appear to have adversely impacted the environment. The metals and organic compounds detected in site media do not pose an unacceptable risk to human health or the environment. Therefore, IT Corporation recommends “No Further Action” and unrestricted land reuse at Motor Pool Area 1300, Parcel 143(7).

1.0 Introduction

The U.S. Army has selected Fort McClellan (FTMC) located in Calhoun County, Alabama, for closure by the Base Realignment and Closure (BRAC) Commission under Public Laws 100-526 and 101-510. The 1990 Base Closure Act, Public Law 101-510, established the process by which U.S. Department of Defense (DOD) installations would be closed or realigned. The BRAC Environmental Restoration Program requires investigation and cleanup of federal properties prior to transfer to the public domain. The U.S. Army is conducting environmental studies of the impact of suspected contaminants at parcels at FTMC under the management of the U.S. Army Corps of Engineers (USACE)-Mobile District. The USACE contracted with IT Corporation (IT) to perform the site investigation (SI) at Motor Pool Area 1300, Parcel 143(7), under Contract Number DACA21-96-D-0018, Task Order CK05.

This SI report presents specific information and results compiled from the SI, including field sampling and analysis and monitoring well installation activities conducted at Motor Pool Area 1300, Parcel 143(7).

1.1 Project Description

Motor Pool Area 1300 was identified as an area to be investigated prior to property transfer. Motor Pool Area 1300, Parcel 143(7), was identified as a Category 7 site in the environmental baseline survey (EBS) (Environmental Science and Engineering, Inc. [ESE], 1998). Category 7 sites are areas that are not evaluated and/or that require further evaluation.

A site-specific field sampling plan (SFSP) attachment (IT, 1998a) and a site-specific safety and health plan (SSHP) attachment were finalized in November 1998. The SFSP and SSHP provide technical guidance for sample collection and analysis at Motor Pool Area 1300, Parcel 143(7). The SFSP was used in conjunction with the SSHP as attachments to the installation-wide work plan (IT, 1998b) and the installation-wide sampling and analysis plan (SAP) (IT, 2000a). The SAP includes the installation-wide safety and health plan and the quality assurance plan.

The SI included field work to collect seven surface soil samples, seven subsurface soil samples, one depositional soil sample, and five groundwater samples to determine whether potential site-specific chemicals are present at Motor Pool Area 1300, Parcel 143(7).

1.2 Purpose and Objectives

The SI program was designed to collect data from site media and provide a level of defensible data and information in sufficient detail to determine whether chemical constituents are present at Motor Pool Area 1300, Parcel 143(7), at concentrations that present an unacceptable risk to human health or the environment. The conclusions of the SI in Chapter 6.0 of this report are based on the comparison of the analytical results to human health site-specific screening levels (SSSL), ecological screening values (ESV), and background screening values for FTMC. The SSSLs and ESVs were developed by IT as part of the human health and ecological risk evaluations associated with SIs being performed under the BRAC Environmental Restoration Program at FTMC. The SSSLs, ESVs, and polynuclear aromatic hydrocarbon (PAH) background screening values are presented in the *Final Human Health and Ecological Screening Values and PAH Background Summary Report* (IT, 2000b). The PAH background screening values were developed by IT at the direction of the BRAC Cleanup Team (BCT) to assess the occurrence of PAH compounds in surface soils as a result of anthropological activities at FTMC. Background metals screening values are presented in the *Final Background Metals Survey Report, Fort McClellan, Alabama* (Science Applications International Corporation [SAIC], 1998).

Based on the conclusions presented in this SI report, the BRAC Cleanup Team will decide either to propose “No Further Action” at the site or to conduct additional work at the site.

1.3 Site Description and History

Motor Pool Area 1300, Parcel 143(7), is located in the northwest part of the Main Post (Figure 1-1). The parcel is a rectangular plot oriented east-west and located west of 2nd Avenue and south of 9th Street (Figure 1-2). The parcel, which covers approximately 1 acre, lies at an elevation of approximately 765 feet above mean sea level and slopes gently to the southwest. The motor pool is currently active and is maintained by the Alabama National Guard.

The area is fenced and consists of six buildings (Buildings T-1331, 1365, T-1367, 1376, 1377, and T-1385) and parking/staging areas for military vehicles. Building T-1367, located in the central portion of the motor pool, is a workshop area for the Alabama National Guard, used for carpentry work and storage of lawn mowers and weed eaters. Military vehicles are parked along the east fence, along the north fence east of Building 1377, and along the west fence. Five cargo shipment containers are located on a concrete pad in the southeastern portion of the parcel, south of Building T-1367.

Building T-1385, which was built in 1942, is a general-purpose storage shed, used for storing fluorescent tubes. Building 1377, which was built in 1980, is a corrugated steel shed located east of Building T-1385, adjacent to 9th Street. At the time of SI activities, Building 1377 was used to store weed eaters, lawn mowers, and roofing tar. Buildings T-1331 and 1376 are located to the west and south, respectively, of the cargo shipment containers in the southeastern portion of the parcel. Building T-1331, which was built in 1941, is a company headquarters functioning as an administrative building. Building 1376 was constructed in 1980 as a general-purpose storage shed for kerosene, paint, concrete sealer, isopropyl alcohol, lubricant, and fuel for lawn mowers and weed eaters. Two concrete slabs and a storage bin were located east of the cargo shipment containers. The slabs and bin were used for storage and coal burning; however, subsequent to SI field activities, Building 1365 was constructed in the southeast corner of the parcel at the location of a former concrete pad. An empty concrete storage pad is also located just south of Building T-1331, between the building and the fence.

The area around Building T-1367 in the center of the parcel is predominantly covered with gravel; however, grass-covered areas are located in the northwest and southern portions of the parcel. An open area grown with vegetation is located to the west and south of the parcel. Buildings T-1315 and T-1366, located east of the parcel, are company headquarters administrative buildings managed by the Alabama National Guard.

The EBS reported a washrack/oil/water separator (OWS) associated with the site (ESE, 1998). However, review of historical records of OWSs at FTMC and review of layout maps indicated Motor Pool Area 1300 did not contain a washrack or OWS. Additionally, a review of aerial photographs did not reveal a washrack. During IT's 1998 site visit to the facility, a washrack was not observed.

2.0 Previous Investigations

An EBS was conducted by ESE to document current environmental conditions of all FTMC property (ESE, 1998). The study was to identify sites that, based on available information, have no history of contamination and comply with DOD guidance for fast-track cleanup at closing installations. The EBS also provides a baseline picture of FTMC properties by identifying and categorizing the properties by seven criteria:

1. Areas where no storage, release, or disposal of hazardous substances or petroleum products has occurred (including no migration of these substances from adjacent areas)
2. Areas where only release or disposal of petroleum products has occurred
3. Areas where release, disposal, and/or migration of hazardous substances has occurred, but at concentrations that do not require removal or remedial response
4. Areas where release, disposal, and/or migration of hazardous substances has occurred, and all removal or remedial actions to protect human health and the environment have been taken
5. Areas where release, disposal, and/or migration of hazardous substances has occurred, and removal or remedial actions are under way, but all required remedial actions have not yet been taken
6. Areas where release, disposal, and/or migration of hazardous substances has occurred, but required actions have not yet been implemented
7. Areas that have not been evaluated or require further evaluation.

The EBS was conducted in accordance with the Community Environmental Response Facilitation Act (CERFA) (CERFA-Public Law 102-426) protocols and DOD policy regarding contamination assessment. Record searches and reviews were performed on all reasonably available documents from FTMC, the Alabama Department of Environmental Management (ADEM), the U.S. Environmental Protection Agency (EPA) Region IV, and Calhoun County, as well as a database search of Comprehensive Environmental Response, Compensation, and Liability Act-regulated substances, petroleum products, and Resource Conservation and Recovery Act-regulated facilities. Available historical maps and aerial photographs were reviewed to document historical land uses. Personal and telephone interviews of past and present FTMC employees and

military personnel were conducted. In addition, visual site inspections were conducted to verify conditions of specific property parcels. Motor Pool Area 1300 was identified as a Category 7 CERFA site: parcels that are not evaluated or that require further evaluation. Previous studies to document site environmental conditions have not been conducted.

3.0 Current Site Investigation Activities

This chapter summarizes SI activities conducted by IT at Motor Pool Area 1300, Parcel 143(7), including environmental sampling and analysis and monitoring well installation activities.

3.1 Environmental Sampling

The environmental sampling performed during the SI at Motor Pool Area 1300, Parcel 143(7), included the collection of surface and depositional soil samples, subsurface soil samples, and groundwater samples for chemical analysis. The sample locations were determined by observing site physical characteristics during a site walk over and by reviewing historical documents pertaining to activities conducted at the site. The sample locations, media, and rationale are summarized in Table 3-1. Sampling locations are shown on Figure 3-1. Samples were submitted for laboratory analysis of site-related parameters listed in Section 3.3.

3.1.1 Surface and Depositional Soil Sampling

Seven surface soil samples and one depositional soil sample were collected at Motor Pool Area 1300, Parcel 143(7), at the locations shown on Figure 3-1. Sampling locations and rationale are presented in Table 3-1. Sample designations and quality assurance/quality control (QA/QC) samples are listed in Table 3-2. Surface and depositional soil sampling locations were determined in the field by the on-site geologist based on the sampling rationale, presence of surface structures, site topography, and proximity to utilities.

Sample Collection. Surface and depositional soil samples were collected from the upper 1 foot of soil with a 3-inch diameter stainless-steel hand auger using the methodology specified in Section 4.9.1.1 of the SAP (IT, 2000a). Surface and depositional soil samples were collected by first removing surface debris, such as rocks and vegetation, from the immediate sample area. The soil was then collected with the sampling device and screened with a photoionization detector (PID) in accordance with Section 4.7.1.1 of the SAP (IT, 2000a). Samples for volatile organic compound (VOC) analysis were collected directly from the sampler with three EnCore[®] samplers. The remaining portion of the sample was transferred to a clean stainless-steel bowl, homogenized, and placed in the appropriate sample containers. The samples were analyzed for the parameters listed in Table 3-2 using methods outlined in Section 3.3. Sample collection logs are included in Appendix A.

Table 3-1

**Sampling Locations and Rationale
Motor Pool Area 1300, Parcel 143(7)
Fort McClellan, Calhoun County, Alabama**

Sample Location	Sample Media	Sample Location Rationale
PPMP-143-GP01	Surface soil Subsurface soil Groundwater	Surface soil, subsurface soil, and groundwater samples were collected from the former concrete storage bin located on the east side of the motor pool area.
PPMP-143-GP02	Surface soil Subsurface soil Groundwater	Surface soil, subsurface soil, and groundwater samples were collected from the gravel-covered vehicle storage area used for vehicle maintenance and storage activities in the northeastern corner of the parcel.
PPMP-143-GP03	Surface soil Subsurface soil Groundwater	Surface soil, subsurface soil, and groundwater samples were collected from the vehicle storage area near the southeast corner of Building T-1377.
PPMP-143-GP04	Surface soil Subsurface soil Groundwater	Surface soil, subsurface soil, and groundwater samples were collected from the vehicle storage area east of a gravel drive in the western section of the parcel.
PPMP-143-GP05	Surface soil Subsurface soil Groundwater	Surface soil, subsurface soil, and groundwater samples were collected from an area in the immediate vicinity (west) of Building 1376 in the southern section of the parcel.
PPMP-143-GP06	Surface soil Subsurface soil	Surface and subsurface soil samples were collected along the south wall of Building T-1367 to assess the effect of activities conducted at this building.
PPMP-143-GP07	Surface soil Subsurface soil	Surface and subsurface soil samples were collected at the northeastern corner of Building T-1367 to assess the effect of activities conducted at this building.
PPMP-143-DEP01	Depositional soil	A depositional soil sample was collected from the most probable exit point of surface water runoff from the site. Evidence of contaminant mobility by surface water within the site would likely be integrated at this location.

Table 3-2

**Surface Soil, Subsurface Soil, and Depositional Soil Sample Designations and QA/QC Samples
Motor Pool Area 1300, Parcel 143(7)
Fort McClellan, Calhoun County, Alabama**

Sample Location	Sample Designation	Sample Depth (ft. bgs)	QA/QC Samples			Analytical Suite
			Field Duplicates	Field Splits	MS/MSD	
PPMP-143-GP01	PPMP-143-GP01-SS-KP0001-REG PPMP-143-GP01-DS-KP0002-REG	0 - 1 9 - 10.5				TCL VOCs, TCL SVOCs TAL Metals
PPMP-143-GP02	PPMP-143-GP02-SS-KP0003-REG PPMP-143-GP02-DS-KP0004-REG	0 - 1 6 - 9			PPMP-143-GP02-SS-KP0003-MS PPMP-143-GP02-SS-KP0003-MSD	TCL VOCs, TCL SVOCs TAL Metals
PPMP-143-GP03	PPMP-143-GP03-SS-KP0005-REG PPMP-143-GP03-DS-KP0008-REG	0 - 1 8 - 10	PPMP-143-GP03-SS-KP0006-FD	PPMP-143-GP03-SS-KP0007-FS		TCL VOCs, TCL SVOCs TAL Metals
PPMP-143-GP04	PPMP-143-GP04-SS-KP0009-REG PPMP-143-GP04-DS-KP0010-REG	0 - 1 9 - 12				TCL VOCs, TCL SVOCs TAL Metals
PPMP-143-GP05	PPMP-143-GP05-SS-KP0011-REG PPMP-143-GP05-DS-KP0012-REG	0 - 1 6 - 9				TCL VOCs, TCL SVOCs TAL Metals
PPMP-143-GP06	PPMP-143-GP06-SS-KP0013-REG PPMP-143-GP06-DS-KP0014-REG	0 - 1 6 - 8				TCL VOCs, TCL SVOCs TAL Metals
PPMP-143-GP07	PPMP-143-GP07-SS-KP0015-REG PPMP-143-GP07-DS-KP0016-REG	0 - 1 6 - 9	PPMP-143-GP07-DS-KP0017-FD			TCL VOCs, TCL SVOCs TAL Metals
PPMP-143-DEP01	PPMP-143-DEP01-DEP-KP0018-REG	0-1				TCL VOCs, TCL SVOCs TAL Metals

FD - Field duplicate.

FS - Field split.

ft. bgs - feet below ground surface.

MS/MSD - Matrix spike/matrix spike duplicate.

QA/QC - Quality assurance/quality control.

REG - Field Sample.

SVOC - Semivolatile organic compound.

TAL - Target analyte list.

TCL - Target compound list.

VOC - Volatile organic compound.

3.1.2 Subsurface Soil Sampling

Subsurface soil samples were collected from seven soil borings at Motor Pool Area 1300, Parcel 143(7), as shown on Figure 3-1. Subsurface soil sampling locations and rationale are presented in Table 3-1. Subsurface soil sample designations, depths, and QA/QC samples are listed in Table 3-2. Soil boring sampling locations were determined in the field by the on-site geologist based on the sampling rationale, presence of surface structures, site topography, and proximity to utilities. IT contracted TEG, Inc., a direct-push technology subcontractor, to assist in subsurface soil sample collection.

Sample Collection. Subsurface soil samples were collected from soil borings at a depth greater than 1 foot below ground surface (bgs) in the unsaturated zone. The soil borings were advanced and soil samples collected using the direct-push sampling procedures specified in Section 4.9.1.1 of the SAP (IT, 2000a). Sample collection logs are included in Appendix A. The samples were analyzed for the parameters listed in Table 3-2 using methods outlined in Section 3.3.

Subsurface soil samples were collected continuously to 12 feet bgs or until direct-push sampler refusal was encountered. Samples were field screened using a PID in accordance with Section 4.7.1.1 of the SAP (IT, 2000a) to measure for volatile organic vapors. The sample showing the highest reading was selected and sent to the laboratory for analysis; however, at those locations where PID readings were not greater than background, the deepest sample interval above groundwater was submitted for analysis. Samples to be analyzed for VOC were collected directly from the sampler with three EnCore samplers. The remaining portion of the sample was transferred to a clean stainless-steel bowl, homogenized, and placed in the appropriate sample containers. Samples submitted for laboratory analysis are summarized in Table 3-2. The on-site geologist constructed a detailed lithological log at each borehole. The lithological logs are included in Appendix B.

At the completion of soil sampling, boreholes were abandoned with bentonite chips which were subsequently hydrated with potable water following borehole abandonment procedures summarized in Appendix B of the SAP (IT, 2000a).

3.1.3 Well Installation

Five temporary wells were installed in the residuum groundwater zone at Motor Pool Area 1300, Parcel 143(7), to collect groundwater samples for laboratory analysis. The well/groundwater

sample locations are shown on Figure 3-1. Table 3-3 summarizes construction details of the temporary wells installed at the site. The well construction logs are included in Appendix B.

IT initially contracted TEG, Inc., to install the five temporary wells with a direct-push sample rig. However, the wells could not be installed using this method, because refusal was encountered at each location prior to reaching groundwater. Consequently, IT contracted Miller Drilling, Inc. to install the five temporary wells with a hollow-stem auger rig at the well/groundwater sample locations shown on Figure 3-1. The wells were installed following procedures outlined in Section 4.7 and Appendix C of the SAP (IT, 2000a). The boreholes at these locations were advanced with a 4.25-inch inside diameter (ID) hollow-stem auger from ground surface to the first water-bearing zone in residuum at the well location. The boreholes were augered to the depth of sampler refusal, and samples were collected from the depth of refusal to the bottom of the borehole. A 2-foot long, 2-inch ID carbon steel split-spoon sampler was driven at 5-foot intervals to collect residuum for observing and describing lithology. Where split-spoon refusal was encountered, the auger was advanced until the first water-bearing zone was encountered. The on-site geologist logging the auger boreholes continued the lithological log for each borehole from the depth of split-spoon sampler refusal to the bottom of the auger borehole by logging the auger drill cuttings. The drill cuttings were logged to determine lithologic changes and the approximate depth of groundwater encountered during drilling. This information was used to determine the optimal placement of the monitoring well screen interval and to provide site-specific geologic and hydrogeologic information. The lithological log for each borehole is included in Appendix B.

Upon reaching the target depth, a 10- or 15-foot length of 2-inch ID, 0.010-inch factory slotted, Schedule 40 polyvinyl chloride (PVC) screen with a 3-inch PVC end cap was placed through the auger to the bottom of the borehole. The screen and end cap were attached to 2-inch ID, flush-threaded Schedule 40 PVC riser. A filter pack consisting of number 1 filter sand (environmentally safe, clean fine sand, sieve size 20 to 40) was tremied around the well screen to approximately 2 feet above the top of the well screen as the augers were removed. The wells were surged using a solid PVC surge block approximately 10 minutes, or until no more settling of the filter sand occurred inside the borehole. A bentonite seal consisting of approximately 2 feet of bentonite chips was placed immediately on top of the filter sand and hydrated with potable water. If the bentonite seal was installed below the water table surface, the bentonite chips were allowed to hydrate in the groundwater. The bentonite seal placement and hydration followed procedures in Appendix C of the SAP (IT, 2000a). A locking well cap was placed on the PVC

Table 3-3

**Temporary Well Construction Summary
Motor Pool Area 1300, Parcel 143(7)
Fort McClellan, Calhoun County, Alabama**

Temporary Well	Northing	Easting	Ground Elevation (ft above msl)	TOC Elevation (ft above msl)	Well Depth (ft bgs)	Screen Length (ft)	Screen Interval (ft bgs)	Well Material
PPMP-143-GP01	1174799.44	670463.02	761.09	764.32	22.50	10	12.25 - 22.25	2" ID Sch. 40 PVC
PPMP-143-GP02	1174900.45	670439.60	763.66	763.45	25.25	10	15.00 - 25.00	2" ID Sch. 40 PVC
PPMP-143-GP03	1174901.80	670357.69	762.04	761.99	22.50	15	7.25 - 22.25	2" ID Sch. 40 PVC
PPMP-143-GP04	1174825.90	670232.75	755.93	755.52	21.50	15	6.25 - 21.25	2" ID Sch. 40 PVC
PPMP-143-GP05	1174743.18	670368.76	757.16	758.82	23.00	15	7.75 - 22.75	2" ID Sch. 40 PVC

Temporary wells installed using a hollow-stem auger.

Horizontal coordinates referenced to the U.S. State Plane Coordinate System, Alabama East Zone, North American Datum of 1983.

Elevations referenced to the North American Vertical Datum of 1988.

2" ID Sch. 40 PVC - 2-inch inside diameter, Schedule 40, polyvinyl chloride.

bgs - Below ground surface.

ft - Feet.

msl - Mean sea level.

TOC - Top of casing.

well casing. The temporary well surface completion included attaching plastic sheeting around the PVC riser using duct tape. Additionally, sand bags were used to secure the sheeting to the ground surface around the temporary well.

The temporary wells were developed by surging and pumping with a 2-inch diameter submersible pump in accordance with methodology outlined in Section 4.8 and Appendix C of the SAP (IT, 2000a). The submersible pump being used for well development was moved in an up-and-down fashion to encourage any residual well installation materials to enter the well. These materials were then pumped out of the well in order to reestablish the natural hydraulic flow conditions. Development was performed until the water turbidity was less than or equal to 20 nephelometric turbidity units (NTU) or for a maximum of 4 hours. The well development logs are included in Appendix C.

3.1.4 Water Level Measurements

The depth to groundwater was measured in all temporary, permanent, and existing wells installed at FTMC on March 13 and 14, 2000, following procedures outlined in Section 4.18 of the SAP (IT, 2000a). Depth to groundwater was measured with electronic water level meters. Each meter probe and cable were cleaned before use at each well following decontamination methodology presented in Section 4.10 of the SAP (IT, 2000a). Measurement was referenced to the top of the well casing. A summary of groundwater level measurements for Motor Pool Area 1300, Parcel 143(7), is presented in Table 3-4.

3.1.5 Groundwater Sampling

Groundwater was sampled from the five temporary wells at Motor Pool Area 1300, Parcel 143(7). The well/groundwater sample locations are shown on Figure 3-1. The groundwater sampling locations and rationale are listed in Table 3-1. The groundwater sample designations and QA/QC samples are listed in Table 3-5.

Sample Collection. Groundwater sampling was performed at the five temporary monitoring well locations following procedures outlined in Section 4.9.1.4 of the SAP (IT, 2000a). Groundwater was sampled after purging a minimum of three well volumes and after field parameters, namely pH, specific conductivity, oxidation-reduction potential, and turbidity, stabilized. Purging and sampling were performed with either a submersible or peristaltic pump equipped with Teflon™ tubing. Field parameters were measured using a calibrated water quality meter. Field parameter readings are summarized in Table 3-6. Sample collection logs are

Table 3-4

**Groundwater Elevations
Motor Pool Area 1300, Parcel 143(7)
Fort McClellan, Calhoun County, Alabama**

Well Location	Date	Depth to Water (ft BTOC)	Ground Elevation (ft above msl)	Top of Casing Elevation (ft above msl)	Groundwater Elevation (ft above msl)
PPMP-143-GP01	14-Mar-00	6.37	761.09	764.32	757.95
PPMP-143-GP02	14-Mar-00	5.58	763.66	763.45	757.87
PPMP-143-GP03	14-Mar-00	6.23	762.04	761.99	755.76
PPMP-143-GP04	14-Mar-00	0.75	755.93	755.52	754.77
PPMP-143-GP05	14-Mar-00	4.48	757.16	758.82	754.34

Elevations referenced to the North American Vertical Datum of 1988.

BTOC - Below top of casing.

ft - Feet.

msl - Mean sea level.

Table 3-5

**Groundwater Sample Designations and QA/QC Samples
Motor Pool Area 1300, Parcel 143(7)
Fort McClellan, Calhoun County, Alabama**

Sample Location	Sample Designation	QA/QC Samples			Analytical Suite
		Field Duplicates	Field Splits	MS/MSD	
PPMP-143-GP01	PPMP-143-GP01-GW-KP3001-REG				TCL VOCs, TCL SVOCs TAL Metals
PPMP-143-GP02	PPMP-143-GP02-GW-KP3002-REG			PPMP-143-GP02-GW-KP3002-MS PPMP-143-GP02-GW-KP3002-MSD	TCL VOCs, TCL SVOCs TAL Metals
PPMP-143-GP03	PPMP-143-GP03-GW-KP3003-REG	PPMP-143-GP03-GW-KP3004-FD	PPMP-143-GP03-GW-KP3005-FS		TCL VOCs, TCL SVOCs TAL Metals
PPMP-143-GP04	PPMP-143-GP04-GW-KP3006-REG				TCL VOCs, TCL SVOCs TAL Metals
PPMP-143-GP05	PPMP-143-GP05-GW-KP3007-REG				TCL VOCs, TCL SVOCs TAL Metals

Groundwater samples were collected from the approximate midpoint of the saturated screened interval of the monitoring well.

FD - Field duplicate.

FS - Field split.

MS/MSD - Matrix spike/matrix spike duplicate.

QA/QC - Quality assurance/quality control.

REG - Field sample.

SVOC - Semivolatile organic compound.

TAL - Target analyte list.

TCL - Target compound list.

VOC - Volatile organic compound.

Table 3-6

**Groundwater Field Parameters
Motor Pool Area 1300, Parcel 143(7)
Fort McClellan, Calhoun County, Alabama**

Sample Location	Date	Media	Specific Conductivity (mS/cm) ^a	Dissolved Oxygen (mg/L)	ORP (mV)	Temperature (°C)	Turbidity (NTU)	pH (SU)
PPMP-143-GP01	5-Feb-99	GW	0.354	0.11	-6.0	18.47	16.8	6.83
PPMP-143-GP02	19-Feb-99	GW	0.124	1.68	209.3	18.74	12.9	5.77
PPMP-143-GP03	19-Feb-99	GW	0.161	2.99	223.3	19.09	1.9	6.05
PPMP-143-GP04	4-Feb-99	GW	0.132	0.55	107.0	19.09	124.0	5.56
PPMP-143-GP05	22-Feb-99	GW	0.201	0.57	73.3	15.17	94.0	6.35

^a Specific conductivity values standardized to millisiemens per centimeter.

°C - Degrees Celsius.

GW - Groundwater.

mg/L - Milligrams per liter.

mS/cm - Millisiemens per centimeter.

mV - Millivolt.

NTU - Nephelometric turbidity unit.

ORP - Oxidation reduction potential.

SU - Standard unit.

included in Appendix A. The samples were analyzed for the parameters listed in Table 3-5 using methods outlined in Section 3.3.

3.2 Surveying of Sample Locations

Sample locations were surveyed using global positioning system survey techniques described in Section 4.3 of the SAP (IT, 2000a) and conventional civil survey techniques described in Section 4.19 of the SAP (IT, 2000a). Horizontal coordinates were referenced to the U.S. State Plane Coordinate System, Alabama East Zone, North American Datum of 1983. Elevations were referenced to the North American Vertical Datum of 1988. Horizontal coordinates and elevations are included in Appendix D.

3.3 Analytical Program

Samples collected during the SI were analyzed for various chemical properties. The specific suite of analysis performed was based on the potential site-specific chemicals historically at the site and EPA, ADEM, FTMC, and USACE requirements. Samples collected from the Motor Pool Area 1300, Parcel 143(7), were analyzed for the following parameters:

- Target compound list VOCs - Method 5035/8260B
- Target compound list semivolatile organic compounds (SVOC) - Method 8270C
- Target analyte list metals - Method 6010B/7000.

The samples were analyzed using EPA SW-846 methods, including Update III methods where applicable, as presented in Table 6-1 in Appendix B of the SAP (IT, 2000a). Data were reported and evaluated in accordance with Corps of Engineers South Atlantic Savannah Level B criteria (USACE, 1994) and the stipulated requirements for the generation of definitive data (Section 3.1.2 of Appendix B of the SAP [IT, 2000a]). Chemical data were reported via hard-copy data packages by the laboratory using Contract Laboratory Program-like forms. These packages were validated in accordance with EPA National Functional Guidelines by Level III criteria. A summary of validated data is included in Appendix E. The Data Validation Summary Report is included as Appendix F.

3.4 Sample Preservation, Packaging, and Shipping

Sample preservation, packaging, and shipping followed requirements specified in Section 4.13.2 of the SAP (IT, 2000a). Sample containers, sample volumes, preservatives, and holding times for the analysis required in this SI are listed in Section 5.0, Table 5-1, of Appendix B of the SAP

(IT, 2000a). Sample documentation and chain-of-custody records were completed as specified in Section 4.13 of the SAP (IT, 2000a).

Completed analysis request and chain-of-custody records (Appendix A) were secured and included with each shipment of sample coolers to Quanterra Environmental Services in Knoxville, Tennessee. Split samples were shipped to USACE South Atlantic Division Laboratory in Marietta, Georgia.

3.5 Investigation-Derived Waste Management and Disposal

Investigation-derived waste (IDW) was managed and disposed as outlined in Appendix D of the SAP (IT, 2000a). The IDW generated during the SI at Motor Pool Area 1300, Parcel 143(7), was segregated as follows:

- Drill cuttings
- Purge water from well development and sampling activities, and decontamination fluids
- Personal protective equipment.

Solid IDW was stored inside the fenced area surrounding Buildings 335 and 336 in lined roll-off bins prior to characterization and final disposal. Solid IDW was characterized using toxicity characteristic leaching procedure analysis. Based on the results, drill cuttings and personal protective equipment generated during the SI at Motor Pool Area 1300, Parcel 143(7), were disposed as nonregulated waste at the Industrial Waste Landfill on the Main Post of FTMC.

Liquid IDW was contained in the existing 20,000-gallon sump associated with the Building T-338 vehicle washrack. Liquid IDW was characterized by VOC, SVOC, and metals analysis. Based on the analysis, liquid IDW was discharged as nonregulated waste to the FTMC wastewater treatment plant on the Main Post.

3.6 Variances/Nonconformances

One variance to the SFSP was recorded during completion of the SI at Motor Pool Area 1300, Parcel 143(7). The variance did not alter the intent of the investigation or the sampling rationale presented in Table 4-2 of the SFSP (IT, 1998a). The variance to the SFSP is summarized in Table 3-7 and included in Appendix G. There were not any nonconformances to the SFSP recorded during completion of the SI at Motor Pool Area 1300, Parcel 143(7).

3.7 Data Quality

The field sample analytical data are presented in tabular form in Appendix E. The field samples were collected, documented, handled, analyzed, and reported in a manner consistent with the SI work plan; the FTMC SAP and installation-wide quality assurance plan; and standard, accepted methods and procedures. Sample collection logs pertaining to the collection of these samples were reviewed and organized for this report and are included in Appendix A. As discussed in Section 3.6, one variance to the SFSP was recorded; however, the variance did not impact the usability of the data.

Data Validation. A complete (100 percent) Level III data validation effort was performed on the reported analytical data. Appendix F consists of a data validation summary report that discusses the results of the validation. Selected results were rejected or otherwise qualified based on the implementation of accepted data validation procedures and practices during the validation effort. These qualified parameters are highlighted in the report. The validation-assigned qualifiers were added to the FTMC IT Environmental Management System™ database for tracking and reporting. The qualified data were used in the comparison to the SSSLs and ESVs developed by IT. Rejected data (assigned an ‘R’ qualifier) were not used in the comparison to the SSSLs and ESVs. The data presented in this report, except where qualified, meet the principle data quality objective for this SI.

Table 3-7

**Variance to the Site-Specific Field Sampling Plan
Motor Pool Area 1300, Parcel 143(7)
Fort McClellan, Calhoun County, Alabama**

Variance to the SFSP	Justification for Variance	Impact to Site Investigation
Sample location PPMP-143-GP03 was moved approximately 35 feet east/southeast of its proposed sample location.	Sample location PPMP-143-GP03 was moved because a building is situated on the proposed sample location.	The relocated sample point is topographically downgradient of the proposed sample location and will more accurately determine the presence or absence of contamination.

4.0 Site Characterization

Subsurface investigations performed at Motor Pool Area 1300, Parcel 143(7), provided soil, geologic, and groundwater data. These data were used to characterize the geology and hydrogeology of the site.

4.1 Regional and Site Geology

4.1.1 Regional Geology

Calhoun County includes parts of two physiographic provinces, the Piedmont Upland Province and the Valley and Ridge Province. The Piedmont Upland Province occupies the extreme eastern and southeastern portions of the county and is characterized by metamorphosed sedimentary rocks. The generally accepted range in age of these metamorphics is Cambrian to Devonian.

The majority of Calhoun County, including the Main Post of FTMC, lies within the Appalachian fold-and-thrust structural belt (Valley and Ridge Province) where southeastward-dipping thrust faults with associated minor folding are the predominant structural features. The fold-and-thrust belt consists of Paleozoic sedimentary rocks that have been asymmetrically folded and thrust-faulted, with major structures and faults striking in a northeast-southwest direction.

Northwestward transport of the Paleozoic rock sequence along the thrust faults has resulted in the imbricate stacking of large slabs of rock referred to as thrust sheets. Within an individual thrust sheet, smaller faults may splay off the larger thrust fault, resulting in imbricate stacking of rock units within an individual thrust sheet (Osborne and Szabo, 1984). Geologic contacts in this region generally strike parallel to the faults, and repetition of lithologic units is common in vertical sequences. Geologic formations within the Valley and Ridge Province portion of Calhoun County have been mapped by Warman and Causey (1962), Osborne and Szabo (1984), and Moser and DeJarnette (1992), and vary in age from Lower Cambrian to Pennsylvanian.

The basal unit of the sedimentary sequence in Calhoun County is the Cambrian Chilhowee Group. The Chilhowee Group consists of the Cochran, Nichols, Wilson Ridge, and Weisner Formations (Osborne and Szabo, 1984) but in Calhoun County is either undifferentiated or divided into the Cochran and Nichols Formations and an upper undifferentiated Wilson Ridge and Weisner Formation. The Cochran is composed of poorly sorted arkosic sandstone and

conglomerate with interbeds of greenish-grey siltstone and mudstone. Massive to laminated, greenish-grey and black mudstone makes up the Nichols Formation, with thin interbeds of siltstone and very fine-grained sandstone (Szabo et al., 1988). These two formations are mapped only in the eastern part of the county.

The Wilson Ridge and Weisner Formations are undifferentiated in Calhoun County and consist of both coarse-grained and fine-grained clastics. The coarse-grained facies appears to dominate the unit and consists primarily of coarse-grained, vitreous quartzite and friable, fine- to coarse-grained, orthoquartzitic sandstone, both of which locally contain conglomerate. The fine-grained facies consists of sandy and micaceous shale and silty, micaceous mudstone which are locally interbedded with the coarse clastic rocks. The abundance of orthoquartzitic sandstone and quartzite suggests that most of the Chilhowee Group bedrock in the vicinity of FTMC belongs to the Weisner Formation (Osborne and Szabo, 1984).

The Cambrian Shady Dolomite overlies the Weisner Formation northeast, east and southwest of the Main Post and consists of interlayered bluish-grey or pale yellowish-grey sandy dolomitic limestone and siliceous dolomite with coarsely crystalline porous chert (Osborne et al., 1989). A variegated shale and clayey silt have been included within the lower part of the Shady Dolomite (Cloud, 1966). Material similar to this lower shale unit was noted in core holes drilled by the Alabama Geologic Survey on FTMC (Osborne and Szabo, 1984). The character of the Shady Dolomite in the FTMC vicinity and the true assignment of the shale at this stratigraphic interval are still uncertain (Osborne, 1999).

The Rome Formation overlies the Shady Dolomite and locally occurs to the northwest and southeast of the Main Post as mapped by Warman and Causey (1962) and Osborne and Szabo (1984), and immediately to the west of Reilly Airfield (Osborne and Szabo, 1984). The Rome Formation consists of variegated, thinly interbedded greyish-red-purple mudstone, shale, siltstone, and greenish-red and light grey sandstone, with locally occurring limestone and dolomite. The Conasauga Formation overlies the Rome Formation and occurs along anticlinal axes in the northeastern portion of Pelham Range (Warman and Causey, 1962), (Osborne and Szabo, 1984) and the northern portion of the Main Post (Osborne et al., 1997). The Conasauga Formation is composed of dark-grey, finely to coarsely crystalline medium- to thick-bedded dolomite with minor shale and chert (Osborne et al., 1989).

Overlying the Conasauga Formation is the Knox Group, which is composed of the Copper Ridge and Chepultepec dolomites of Cambro-Ordovician age. The Knox Group is undifferentiated in

Calhoun County and consists of light medium grey, fine to medium crystalline, variably bedded to laminated, siliceous dolomite and dolomitic limestone that weather to a chert residuum (Osborne and Szabo, 1984). The Knox Group underlies a large portion of the Pelham Range area.

The Ordovician Newala and Little Oak Limestones overlie the Knox Group. The Newala Limestone consists of light to dark grey, micritic, thick-bedded limestone with minor dolomite. The Little Oak Limestone is comprised of dark grey, medium- to thick-bedded, fossiliferous, argillaceous to silty limestone with chert nodules. These limestone units are mapped together as undifferentiated at FTMC and other parts of Calhoun County. The Athens Shale overlies the Ordovician limestone units. The Athens Shale consists of dark-grey to black shale and graptolitic shale with localized interbedded dark grey limestone (Osborne et al., 1989). These units occur within an eroded “window” in the uppermost structural thrust sheet at FTMC and underlie much of the developed area of the Main Post.

Other Ordovician-aged bedrock units mapped in Calhoun County include the Greensport Formation, Colvin Mountain Sandstone, and Sequatchie Formation. These units consist of various siltstones, sandstones, shales, dolomites and limestones, and are mapped as one, undifferentiated unit in some areas of Calhoun County. The only Silurian-age sedimentary formation mapped in Calhoun County is the Red Mountain Formation. This unit consists of interbedded red sandstone, siltstone, and shale with greenish-grey to red silty and sandy limestone.

The Devonian Frog Mountain Sandstone consists of sandstone and quartzitic sandstone with shale interbeds, dolomudstone, and glauconitic limestone (Szabo et al., 1988). This unit locally occurs in the western portion of Pelham Range.

The Mississippian Fort Payne Chert and the Maury Formation overlie the Frog Mountain Sandstone and are composed of dark- to light-grey limestone with abundant chert nodules and greenish-grey to greyish-red phosphatic shale, with increasing amounts of calcareous chert toward the upper portion of the formation (Osborne and Szabo, 1984). These units occur in the northwestern portion of Pelham Range. Overlying the Fort Payne Chert is the Floyd Shale, also of Mississippian age, which consists of thin-bedded, fissile brown to black shale with thin intercalated limestone layers and interbedded sandstone. Osborne and Szabo (1984) reassigned

the Floyd Shale, which was mapped by Warman and Causey (1962) on the Main Post of FTMC, to the Ordovician Athens Shale on the basis of fossil data.

The Jacksonville Thrust Fault is the most significant structural geologic feature in the vicinity of FTMC, both for its role in determining the stratigraphic relationships in the area and for its contribution to regional water supplies. The trace of the fault extends northeastward for approximately 39 miles between Bynum, Alabama and Piedmont, Alabama. The fault is interpreted as a major splay of the Pell City Fault (Osborne and Szabo, 1984). The Ordovician sequence that makes up the Eden thrust sheet is exposed at FTMC through an eroded “window,” or “fenster,” in the overlying thrust sheet. Rocks within the window display complex folding, with the folds being overturned and tight to isoclinal. The carbonates and shales locally exhibit well-developed cleavage (Osborne and Szabo, 1984). The FTMC window is framed on the northwest by the Rome Formation, north by the Conasauga Formation, northeast, east, and southwest by the Shady Dolomite, and southeast and southwest by the Chilhowee Group (Osborne et al., 1997).

4.1.2 Site Geology

The soils at Motor Pool Area 1300, Parcel 143(7), are classified in the Rarden series. These soils consist of moderately well drained, strongly acid to very strongly acid soils that generally occur in large areas on wide shale ridges. These soils have developed from the residuum of shale and fine-grained, platy sandstone or limestone. Concretions and fragments of sandstone, up to one-half inch in diameter, are commonly on and in the soil. The specific category of this soil for Motor Pool Area 1300, Parcel 143(7), is Rarden silty clay loam, shallow, 2 to 6 percent slopes, severely eroded (ReB3). This type of Rarden soil has mild slopes, high erosion, and high runoff. Erosion has removed all or nearly all of the original brown silt loam surface soil (depth from surface is 0 to 14 inches). The original depth of the subsoil ranged from 14 to 44 inches from the surface. Erosion is a serious hazard, runoff is high, and shallow gullies often occur (U.S. Department of Agriculture, 1961). Infiltration is medium, permeability is slow, and capacity for available moisture is low.

Bedrock beneath Motor Pool Area 1300, Parcel 143(7), is mapped as Mississippian Ordovician Floyd/Athens Shale, undifferentiated (Osborne, et al., 1997). These units occur within the eroded “window” in the uppermost structural thrust sheet at FTMC and underlie much of the developed area on the Main Post of FTMC.

Based on direct-push and hollow-stem auger boring data collected during the SI, residuum soils beneath Motor Pool Area 1300, Parcel 143(7), consists of predominately clay and silt overlying weathered shale. The weathered shale was encountered at depths ranging from approximately 8 to 16 feet bgs across the site. A geologic cross-section was constructed with boring log data from Motor Pool Area 1300, Parcel 143(7), and is presented on Figure 4-1. The geologic cross-section location is shown on Figure 3-1.

4.2 Site Hydrology

4.2.1 Surface Hydrology

Precipitation in the form of rainfall averages about 54 inches annually in Anniston, Alabama, with infiltration rates annually exceeding evapotranspiration rates. The major surface water features at the Main Post of FTMC include Remount Creek, Cane Creek, and Cave Creek. These waterways flow in a general northwest to westerly direction towards the Coosa River on the western boundary of Calhoun County.

Surface water runoff at Motor Pool Area 1300, Parcel 143(7), follows site topography, which slopes gently to the southwest.

4.2.2 Hydrogeology

During soil boring and well installation activities, groundwater was encountered in the borings at depths ranging from 14.5 feet bgs in PPMP-143-GP04 to 23 feet bgs in PPMP-143-GP02 (Appendix B).

Static groundwater levels were measured in monitoring wells at Motor Pool Area 1300, Parcel 143(7), on March 14, 2000, as summarized in Table 3-4. Groundwater elevations were calculated by measuring the depth to groundwater relative to the surveyed top-of-casing elevations. A groundwater elevation map constructed from the March 2000 data is shown on Figure 4-2. Based on the groundwater elevation contour map, horizontal groundwater generally flows to the west-southwest. Static groundwater levels summarized in Table 3-4 are at shallower depths than the depth to groundwater encountered during drilling (Appendix B). This indicates that the groundwater has an upward vertical hydraulic head and is under semiconfined conditions.

5.0 Summary of Analytical Results

The results of the chemical analysis of samples collected at Motor Pool Area 1300, Parcel 143(7), indicate that metals, VOCs, and SVOCs have been detected in the various site media. To evaluate whether the detected constituents present an unacceptable risk to human health and the environment, analytical results were compared to the human health SSSLs and ESVs for FTMC. The SSSLs and ESVs were developed by IT for human health and ecological risk evaluations as part of the ongoing SIs being performed under the BRAC Environmental Restoration Program at FTMC.

Metal concentrations exceeding the SSSLs and ESVs were subsequently compared to metals background screening values (background concentrations) (SAIC, 1998) to determine if the metals concentrations are within natural background concentrations. Summary statistics for background metals samples collected at FTMC (SAIC, 1998) are included in Appendix H. Additionally, SVOC concentrations in surface soils that exceeded the SSSLs and ESVs were compared to PAH background screening values, where available. The PAH background screening values were derived from analytical data from 18 parcels at FTMC that were determined to represent anthropogenic activity (IT, 2000b). PAH background screening values were developed for two categories of surface soils: beneath asphalt and adjacent to asphalt. The PAH background screening values for soils adjacent to asphalt are the more conservative (i.e., lower) of the PAH background values and are the values used herein for comparison.

Six compounds were quantified by both SW-846 Method 8260B (as VOC) and Method 8270C (as SVOC), namely 1,2,4-trichlorobenzene, 1,4-dichlorobenzene, 1,3-dichlorobenzene, 1,2-dichlorobenzene, hexachlorobutadiene, and naphthalene. Method 8260B yields a reporting limit (RL) of 0.005 milligrams per kilogram (mg/kg), while Method 8270C has a RL of 0.330 mg/kg, which is typical for a soil matrix sample. Because the direct nature of the Method 8260B analysis results in a lower RL, this method should be considered superior to Method 8270C when quantifying low levels (0.005 to 0.330 mg/kg) of these compounds. However, Method 8270C and its associated methylene chloride extraction step is superior when dealing with samples that contain higher concentrations (greater than 0.330 mg/kg) of these compounds. Therefore, all data were considered, and none were categorically excluded. Data validation qualifiers were helpful in evaluating the usability of data, especially if calibration, blank contamination, precision, or accuracy indicator anomalies were encountered. The validation qualifiers and

concentrations reported (e.g., whether concentrations were less than or greater than 0.330 mg/kg) were used to determine which analytical method was likely to return the more nearly accurate result.

The following sections and Tables 5-1 through 5-3 summarize the results of the comparison of detected constituents to the SSSLs, ESVs, and background screening values. Complete analytical results are presented in Appendix E.

5.1 Surface and Depositional Soil Analytical Results

Seven surface soil samples and one depositional soil sample were collected for chemical analysis at Motor Pool Area 1300, Parcel 143(7). Surface and depositional soil samples were collected from the upper 1 foot of soil at the locations shown on Figure 3-1. Analytical results were compared to residential human health SSSLs, ESVs, and background screening values, as presented in Table 5-1.

Metals. Twenty-two metals were detected in surface and depositional soil samples collected at Motor Pool Area 1300, Parcel 143(7). The concentrations of arsenic (at all locations) and iron (at all locations) exceeded SSSLs but were below their respective background screening values.

The following metals were detected at concentrations exceeding ESVs and the respective background screening values: mercury (at one location) and zinc (at five locations). However, the concentrations of zinc at four of the five locations were within the range of background concentrations.

Volatile Organic Compounds. Seven VOCs, namely, acetone, bromomethane, chloromethane, methylene chloride, toluene, trichlorofluoromethane, and m,p-xylenes, were detected in surface and depositional soil samples collected at Motor Pool Area 1300, Parcel 143(7). The bromomethane, chloromethane, methylene chloride, and three of the five acetone results were flagged with a 'B' data qualifier, signifying that these compounds were also detected in an associated laboratory or field blank. The remaining VOC results were flagged with a 'J' data qualifier, signifying that the results were greater than the method detection limit but less than the RL.

The VOC concentrations in surface and depositional soils were below SSSLs and ESVs.

Table 5-1

**Surface and Depositional Soil Analytical Results
Motor Pool Area 1300, Parcel 143(7)
Fort McClellan, Calhoun County, Alabama**

(Page 1 of 3)

Sample Location Sample Number Sample Date Sample Depth (Feet)					PPMP-143-DEP01 KP0018 17-Mar-99 0- 1					PPMP-143-GP01 KP0001 12-Jan-99 0- 1					PPMP-143-GP02 KP0003 12-Jan-99 0- 1					PPMP-143-GP03 KP0005 12-Jan-99 0- 1					
Parameter	Units	BKG ^a	SSSL ^b	ESV ^b	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV	
METALS																									
Aluminum	mg/kg	1.63E+04	7.80E+03	5.00E+01	2.03E+03				YES	4.74E+03				YES	3.77E+03				YES	3.38E+03					YES
Arsenic	mg/kg	1.37E+01	4.26E-01	1.00E+01	1.10E+00	J		YES		4.00E+00			YES		1.70E+00			YES		1.70E+00				YES	
Barium	mg/kg	1.24E+02	5.47E+02	1.65E+02	2.21E+01	J				2.48E+01					1.49E+01	J				1.19E+01	J				
Beryllium	mg/kg	8.00E-01	9.60E+00	1.10E+00	1.40E-01	J				3.00E-01	J				2.10E-01	J				2.00E-01	J				
Cadmium	mg/kg	2.90E-01	6.25E+00	1.60E+00	ND					ND					ND					ND					
Calcium	mg/kg	1.72E+03	NA	NA	9.60E+02					1.23E+03					2.52E+03		YES			1.92E+03		YES			
Chromium	mg/kg	3.70E+01	2.32E+01	4.00E-01	3.00E+00			YES		1.43E+01	J			YES	1.30E+01	J			YES	1.41E+01	J				YES
Cobalt	mg/kg	1.52E+01	4.68E+02	2.00E+01	1.30E+00	J				ND					ND					ND					
Copper	mg/kg	1.27E+01	3.13E+02	4.00E+01	4.20E+00					7.00E+00					4.80E+00					5.40E+00					
Iron	mg/kg	3.42E+04	2.34E+03	2.00E+02	3.31E+03			YES	YES	1.58E+04			YES	YES	6.23E+03			YES	YES	8.26E+03			YES	YES	
Lead	mg/kg	4.01E+01	4.00E+02	5.00E+01	9.60E+00					1.82E+01					6.20E+00					4.10E+00					
Magnesium	mg/kg	1.03E+03	NA	4.40E+05	2.05E+02	J				3.38E+02	J				5.93E+02					8.43E+02					
Manganese	mg/kg	1.58E+03	3.63E+02	1.00E+02	6.83E+01	J				1.20E+02	J			YES	4.56E+01	J				4.78E+01	J				
Mercury	mg/kg	8.00E-02	2.33E+00	1.00E-01	3.20E-02	J				2.80E-02	J				2.00E-02	J				1.80E-02	J				
Nickel	mg/kg	1.03E+01	1.54E+02	3.00E+01	ND					4.20E+00	J				2.90E+00	J				2.80E+00	J				
Potassium	mg/kg	8.00E+02	NA	NA	9.14E+01	J				3.82E+02	J				1.67E+02	J				2.08E+02	J				
Selenium	mg/kg	4.80E-01	3.91E+01	8.10E-01	ND					7.40E-01		YES			ND					ND					
Silver	mg/kg	3.60E-01	3.91E+01	2.00E+00	ND					1.00E+00	J	YES			ND					5.60E-01	J	YES			
Sodium	mg/kg	6.34E+02	NA	NA	8.34E+01	B				1.25E+01	B				9.30E+00	B				4.30E+00	J				
Thallium	mg/kg	3.43E+00	5.08E-01	1.00E+00	4.60E-01	B				ND					ND					ND					
Vanadium	mg/kg	5.88E+01	5.31E+01	2.00E+00	7.40E+00				YES	1.09E+01				YES	1.05E+01				YES	1.21E+01					YES
Zinc	mg/kg	4.06E+01	2.34E+03	5.00E+01	1.94E+02	J	YES		YES	5.37E+01		YES		YES	9.50E+00					9.40E+00					
VOLATILE ORGANIC COMPOUNDS																									
Acetone	mg/kg	NA	7.76E+02	2.50E+00	1.30E-02	J				1.30E-02	B				7.40E-03	B				ND					
Bromomethane	mg/kg	NA	1.09E+01	NA	ND					2.60E-03	B				2.20E-03	B				2.90E-03	B				
Chloromethane	mg/kg	NA	4.85E+01	1.00E-01	ND					2.20E-03	B				ND					2.10E-03	B				
Methylene chloride	mg/kg	NA	8.41E+01	2.00E+00	3.70E-03	B				2.30E-03	B				2.00E-03	B				2.20E-03	B				
Toluene	mg/kg	NA	1.55E+03	5.00E-02	ND					ND					2.30E-03	J				ND					
Trichlorofluoromethane	mg/kg	NA	2.33E+03	1.00E-01	3.20E-03	J				ND					ND					ND					
m,p-Xylenes	mg/kg	NA	1.55E+04	5.00E-02	ND					ND					4.00E-03	J				ND					
SEMIVOLATILE ORGANIC COMPOUNDS																									
Acenaphthylene	mg/kg	8.91E-01	4.63E+02	6.82E+02	ND					ND					ND					ND					
Benzo(a)anthracene	mg/kg	1.19E+00	8.51E-01	5.21E+00	ND					4.10E-02	J				ND					ND					
Benzo(a)pyrene	mg/kg	1.42E+00	8.51E-02	1.00E-01	ND					4.70E-02	J				4.20E-02	J				ND					
Benzo(b)fluoranthene	mg/kg	1.66E+00	8.51E-01	5.98E+01	ND					4.00E-02	J				4.30E-02	J				ND					
Benzo(ghi)perylene	mg/kg	9.55E-01	2.32E+02	1.19E+02	ND					ND					4.00E-02	J				ND					
Benzo(k)fluoranthene	mg/kg	1.45E+00	8.51E+00	1.48E+02	ND					5.80E-02	J				4.50E-02	J				ND					
Chrysene	mg/kg	1.40E+00	8.61E+01	4.73E+00	ND					4.30E-02	J				ND					ND					
Di-n-butyl phthalate	mg/kg	NA	7.80E+02	2.00E+02	ND					6.90E-02	J				3.60E-02	J				6.80E-02	J				
Dibenz(a,h)anthracene	mg/kg	7.20E-01	8.61E-02	1.84E+01	ND					ND					ND					ND					
Fluoranthene	mg/kg	2.03E+00	3.09E+02	1.00E-01	ND					5.40E-02	J				ND					ND					
Indeno(1,2,3-cd)pyrene	mg/kg	9.37E-01	8.51E-01	1.09E+02	ND					ND					ND					ND					
Pyrene	mg/kg	1.63E+00	2.33E+02	1.00E-01	ND					5.30E-02	J				ND					ND					
bis(2-Ethylhexyl)phthalate	mg/kg	NA	4.52E+01	9.30E-01	ND					5.70E-02	B				6.40E-02	B				4.90E-02	B				

Table 5-1

**Surface and Depositional Soil Analytical Results
Motor Pool Area 1300, Parcel 143(7)
Fort McClellan, Calhoun County, Alabama**

(Page 2 of 3)

Sample Location Sample Number Sample Date Sample Depth (Feet)					PPMP-143-GP04 KP0009 12-Jan-99 0- 1					PPMP-143-GP05 KP0011 12-Jan-99 0- 1					PPMP-143-GP06 KP0013 12-Jan-99 0- 1					PPMP-143-GP07 KP0015 12-Jan-99 0- 1					
Parameter	Units	BKG ^a	SSSL ^b	ESV ^b	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV	
METALS																									
Aluminum	mg/kg	1.63E+04	7.80E+03	5.00E+01	5.12E+03				YES	6.31E+03				YES	6.59E+03				YES	5.95E+03				YES	
Arsenic	mg/kg	1.37E+01	4.26E-01	1.00E+01	4.70E+00				YES	2.20E+00			YES		2.60E+00			YES		1.70E+00			YES		
Barium	mg/kg	1.24E+02	5.47E+02	1.65E+02	3.33E+01					3.08E+01					1.73E+01	J				5.94E+01					
Beryllium	mg/kg	8.00E-01	9.60E+00	1.10E+00	6.70E-01					2.40E-01	J				2.80E-01	J				7.20E-01					
Cadmium	mg/kg	2.90E-01	6.25E+00	1.60E+00	ND					ND					1.00E+00		YES			ND					
Calcium	mg/kg	1.72E+03	NA	NA	1.60E+04		YES			4.81E+02	J				5.33E+03		YES			6.52E+04		YES			
Chromium	mg/kg	3.70E+01	2.32E+01	4.00E-01	1.82E+01	J			YES	8.30E+00	J			YES	1.39E+01	J			YES	7.20E+00	J				YES
Cobalt	mg/kg	1.52E+01	4.68E+02	2.00E+01	ND					2.20E+00	J				ND					ND					
Copper	mg/kg	1.27E+01	3.13E+02	4.00E+01	1.12E+01					3.40E+00					5.30E+00					3.80E+00					
Iron	mg/kg	3.42E+04	2.34E+03	2.00E+02	1.46E+04			YES	YES	9.14E+03			YES	YES	1.13E+04			YES	YES	4.63E+03			YES	YES	
Lead	mg/kg	4.01E+01	4.00E+02	5.00E+01	2.67E+01					6.70E+00					1.26E+01					1.87E+01					
Magnesium	mg/kg	1.03E+03	NA	4.40E+05	5.94E+03		YES			2.40E+02	J				2.56E+03		YES			3.02E+04		YES			
Manganese	mg/kg	1.58E+03	3.63E+02	1.00E+02	2.05E+02	J			YES	1.33E+02	J			YES	3.22E+01	J				1.88E+02	J				YES
Mercury	mg/kg	8.00E-02	2.33E+00	1.00E-01	2.80E-02	J				3.50E-02	J				6.30E-01		YES		YES	2.20E-02	J				
Nickel	mg/kg	1.03E+01	1.54E+02	3.00E+01	7.10E+00					3.70E+00	J				2.50E+00	J				2.60E+00	J				
Potassium	mg/kg	8.00E+02	NA	NA	3.57E+02	J				1.26E+02	J				2.03E+02	J				6.16E+02					
Selenium	mg/kg	4.80E-01	3.91E+01	8.10E-01	5.00E-01	J	YES			ND					6.10E-01		YES			ND					
Silver	mg/kg	3.60E-01	3.91E+01	2.00E+00	7.80E-01	J	YES			4.60E-01	J	YES			9.10E-01	J	YES			ND					
Sodium	mg/kg	6.34E+02	NA	NA	3.94E+01	J				9.00E+00	B				1.47E+01	B				9.64E+01	J				
Thallium	mg/kg	3.43E+00	5.08E-01	1.00E+00	ND																				
Vanadium	mg/kg	5.88E+01	5.31E+01	2.00E+00	1.22E+01				YES	8.50E+00				YES	1.22E+01				YES	1.88E+01					YES
Zinc	mg/kg	4.06E+01	2.34E+03	5.00E+01	8.67E+01		YES		YES	9.20E+00					1.51E+02		YES		YES	2.83E+02		YES			YES
VOLATILE ORGANIC COMPOUNDS																									
Acetone	mg/kg	NA	7.76E+02	2.50E+00	2.00E-02	J				2.80E-02	B				ND					ND					
Bromomethane	mg/kg	NA	1.09E+01	NA	3.00E-03	B				2.20E-03	B				2.10E-03	B				1.70E-03	B				
Chloromethane	mg/kg	NA	4.85E+01	1.00E-01	2.00E-03	B				ND					ND					ND					
Methylene chloride	mg/kg	NA	8.41E+01	2.00E+00	2.40E-03	B				2.30E-03	B				2.10E-03	B				2.20E-03	B				
Toluene	mg/kg	NA	1.55E+03	5.00E-02	ND																				
Trichlorofluoromethane	mg/kg	NA	2.33E+03	1.00E-01	ND																				
m,p-Xylenes	mg/kg	NA	1.55E+04	5.00E-02	ND																				
SEMIVOLATILE ORGANIC COMPOUNDS																									
Acenaphthylene	mg/kg	8.91E-01	4.63E+02	6.82E+02	ND					ND					ND					5.90E-02	J				
Benzo(a)anthracene	mg/kg	1.19E+00	8.51E-01	5.21E+00	ND					ND					ND					5.70E-02	J				
Benzo(a)pyrene	mg/kg	1.42E+00	8.51E-02	1.00E-01	5.80E-02	J				ND					ND					9.80E-02	J			YES	
Benzo(b)fluoranthene	mg/kg	1.66E+00	8.51E-01	5.98E+01	4.00E-02	J				ND					ND					9.90E-02	J				
Benzo(ghi)perylene	mg/kg	9.55E-01	2.32E+02	1.19E+02	5.50E-02	J				ND					ND					1.60E-01	J				
Benzo(k)fluoranthene	mg/kg	1.45E+00	8.51E+00	1.48E+02	ND					ND					ND					1.10E-01	J				
Chrysene	mg/kg	1.40E+00	8.61E+01	4.73E+00	3.80E-02	J				ND					ND					8.60E-02	J				
Di-n-butyl phthalate	mg/kg	NA	7.80E+02	2.00E+02	ND																				
Dibenz(a,h)anthracene	mg/kg	7.20E-01	8.61E-02	1.84E+01	ND					ND					ND					3.60E-02	J				
Fluoranthene	mg/kg	2.03E+00	3.09E+02	1.00E-01	3.70E-02	J				ND					3.80E-02	J				3.00E-02	J				
Indeno(1,2,3-cd)pyrene	mg/kg	9.37E-01	8.51E-01	1.09E+02	4.20E-02	J				ND					ND					9.50E-02	J				
Pyrene	mg/kg	1.63E+00	2.33E+02	1.00E-01	4.20E-02	J				ND					ND					3.70E-02	J				
bis(2-Ethylhexyl)phthalate	mg/kg	NA	4.52E+01	9.30E-01	5.40E-01	B				7.40E-02	B				8.20E-01					9.60E-02	B				

Table 5-1

**Surface and Depositional Soil Analytical Results
Motor Pool Area 1300, Parcel 143(7)
Fort McClellan, Calhoun County, Alabama**

(Page 3 of 3)

Analyses performed by Quanterra Environmental Services using U.S. Environmental Protection Agency (EPA) SW-846 analytical methods, including Update III methods where applicable.

^a Bkg - Background. Concentration listed is two times (2x) the arithmetic mean of background metals concentration given in Science Applications International Corporation (1998), *Final Background Metals Survey Report, Fort McClellan, Alabama*, July.

^b Residential human health site-specific screening level (SSSL) and ecological screening value (ESV) as given in IT Corporation (2000b), *Final Human Health and Ecological Screening Values and PAH Background Summary Report, Fort McClellan, Calhoun County, Alabama*, July.

B - Analyte detected in laboratory or field blank at concentration greater than the reporting limit (and greater than zero).

J - Result is greater than the method detection limit but less than or equal to the reporting limit.

mg/kg - Milligrams per kilogram.

NA - Not available.

ND - Not detected.

Qual - Data validation qualifier.

Table 5-2

**Subsurface Soil Analytical Results
Motor Pool Area 1300, Parcel 143(7)
Fort McClellan, Calhoun County, Alabama**

(Page 1 of 2)

Sample Location Sample Number Sample Date Sample Depth (Feet)		PPMP-143-GP01 KP0002 12-Jan-99 9 - 10				PPMP-143-GP02 KP0004 12-Jan-99 6 - 9				PPMP-143-GP03 KP0008 12-Jan-99 8 - 10				PPMP-143-GP04 KP0010 12-Jan-99 9 - 12					
Parameter	Units	BKG ^a	SSSL ^b	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL
METALS																			
Aluminum	mg/kg	1.36E+04	7.80E+03	1.70E+04		YES	YES	6.37E+03				1.36E+04		YES	YES	1.21E+04			YES
Arsenic	mg/kg	1.83E+01	4.26E-01	8.60E+00			YES	3.00E+00			YES	4.00E+00			YES	3.50E+00			YES
Barium	mg/kg	2.34E+02	5.47E+02	1.97E+02				1.36E+01	J			8.47E+01				6.85E+01			
Beryllium	mg/kg	8.60E-01	9.60E+00	1.80E+00		YES		2.70E-01	J			8.90E-01		YES		1.20E+00		YES	
Cadmium	mg/kg	2.20E-01	6.25E+00	8.70E-01		YES		ND				ND				ND			
Calcium	mg/kg	6.37E+02	NA	1.99E+03		YES		4.47E+01	J			1.35E+03		YES		2.70E+02	J		
Chromium	mg/kg	3.83E+01	2.32E+01	2.20E+01	J			1.61E+01	J			1.57E+01	J			1.84E+01	J		
Cobalt	mg/kg	1.75E+01	4.68E+02	1.00E+01				ND				ND				ND			
Copper	mg/kg	1.94E+01	3.13E+02	6.77E+01		YES		9.50E+00				4.51E+01		YES		6.29E+01		YES	
Iron	mg/kg	4.48E+04	2.34E+03	4.83E+04		YES	YES	1.83E+04			YES	2.53E+04			YES	3.04E+04			YES
Lead	mg/kg	3.85E+01	4.00E+02	2.39E+01				5.50E+00				1.13E+01				1.55E+01			
Magnesium	mg/kg	7.66E+02	NA	7.94E+03		YES		1.83E+02	J			2.27E+03		YES		2.59E+03		YES	
Manganese	mg/kg	1.36E+03	3.63E+02	7.15E+02	J		YES	2.54E+01	J			2.59E+01	J			2.18E+01	J		
Mercury	mg/kg	7.00E-02	2.33E+00	3.20E-02	J			1.50E-02	J			9.10E-02		YES		4.10E-02			
Nickel	mg/kg	1.29E+01	1.54E+02	4.75E+01		YES		3.40E+00	J			1.75E+01		YES		2.37E+01		YES	
Potassium	mg/kg	7.11E+02	NA	4.03E+02	J			3.24E+02	J			6.06E+02				4.59E+02	J		
Selenium	mg/kg	4.70E-01	3.91E+01	1.80E+00		YES		7.50E-01		YES		1.10E+00		YES		1.30E+00		YES	
Silver	mg/kg	2.40E-01	3.91E+01	2.70E+00		YES		1.40E+00		YES		1.90E+00		YES		2.20E+00		YES	
Sodium	mg/kg	7.02E+02	NA	1.04E+02	J			ND				4.30E+01	J			4.30E+01	J		
Vanadium	mg/kg	6.49E+01	5.31E+01	8.60E+00				1.27E+01				ND				4.70E+00	B		
Zinc	mg/kg	3.49E+01	2.34E+03	1.80E+02		YES		1.04E+01				4.24E+01		YES		7.30E+01		YES	
VOLATILE ORGANIC COMPOUNDS																			
Acetone	mg/kg	NA	7.76E+02	4.30E-02	J			5.00E-02	J			1.30E-01	J			4.70E-02	J		
Bromomethane	mg/kg	NA	1.09E+01	2.20E-03	B			2.40E-03	B			1.80E-03	B			3.20E-03	B		
Chloromethane	mg/kg	NA	4.85E+01	ND				ND				ND				2.10E-03	B		
Methylene chloride	mg/kg	NA	8.41E+01	2.00E-03	B			2.20E-03	B			2.20E-03	B			2.30E-03	B		
SEMIVOLATILE ORGANIC COMPOUNDS																			
Di-n-butyl phthalate	mg/kg	NA	7.80E+02	ND				ND				ND				ND			
bis(2-Ethylhexyl)phthalate	mg/kg	NA	4.52E+01	ND				5.60E-02	B			1.00E-01	B			6.80E-02	B		

Table 5-2

**Subsurface Soil Analytical Results
Motor Pool Area 1300, Parcel 143(7)
Fort McClellan, Calhoun County, Alabama**

(Page 2 of 2)

Sample Location Sample Number Sample Date Sample Depth (Feet)				PPMP-143-GP05 KP0012 12-Jan-99 6 - 9				PPMP-143-GP06 KP0014 12-Jan-99 6 - 8				PPMP-143-GP07 KP0016 12-Jan-99 6 - 9			
Parameter	Units	BKG ^a	SSSL ^b	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL
METALS															
Aluminum	mg/kg	1.36E+04	7.80E+03	1.74E+04		YES	YES	8.60E+03			YES	5.28E+03			
Arsenic	mg/kg	1.83E+01	4.26E-01	7.20E+00			YES	5.80E+00			YES	1.30E+00			YES
Barium	mg/kg	2.34E+02	5.47E+02	1.38E+02				7.25E+01				2.73E+01			
Beryllium	mg/kg	8.60E-01	9.60E+00	2.00E+00		YES		6.50E-01				1.20E-01	J		
Cadmium	mg/kg	2.20E-01	6.25E+00	4.40E-01	J	YES		ND				ND			
Calcium	mg/kg	6.37E+02	NA	1.11E+03		YES		2.23E+03		YES		6.76E+02		YES	
Chromium	mg/kg	3.83E+01	2.32E+01	2.52E+01	J		YES	1.98E+01	J			7.50E+00	J		
Cobalt	mg/kg	1.75E+01	4.68E+02	4.80E+00	J			ND				ND			
Copper	mg/kg	1.94E+01	3.13E+02	5.04E+01		YES		2.09E+01		YES		4.80E+00			
Iron	mg/kg	4.48E+04	2.34E+03	4.30E+04			YES	3.12E+04			YES	1.00E+04			YES
Lead	mg/kg	3.85E+01	4.00E+02	1.61E+01				1.22E+01				6.10E+00			
Magnesium	mg/kg	7.66E+02	NA	5.74E+03		YES		2.26E+03		YES		5.54E+02	J		
Manganese	mg/kg	1.36E+03	3.63E+02	4.55E+02	J		YES	6.92E+01	J			1.50E+01	J		
Mercury	mg/kg	7.00E-02	2.33E+00	6.90E-02				3.30E-02	J			2.30E-02	J		
Nickel	mg/kg	1.29E+01	1.54E+02	4.22E+01		YES		1.27E+01				2.50E+00	J		
Potassium	mg/kg	7.11E+02	NA	6.75E+02				3.08E+02	J			3.09E+02	J		
Selenium	mg/kg	4.70E-01	3.91E+01	1.60E+00		YES		1.20E+00		YES		ND			
Silver	mg/kg	2.40E-01	3.91E+01	2.50E+00		YES		1.90E+00		YES		9.30E-01	J	YES	
Sodium	mg/kg	7.02E+02	NA	6.42E+01	J			2.95E+01	B			1.16E+01	B		
Vanadium	mg/kg	6.49E+01	5.31E+01	ND				1.90E+00	B			7.30E+00			
Zinc	mg/kg	3.49E+01	2.34E+03	1.21E+02		YES		3.29E+01				8.20E+00			
VOLATILE ORGANIC COMPOUNDS															
Acetone	mg/kg	NA	7.76E+02	1.70E-01	J			2.60E-02	J			7.00E-02	J		
Bromomethane	mg/kg	NA	1.09E+01	2.30E-03	B			2.10E-03	B			2.30E-03	B		
Chloromethane	mg/kg	NA	4.85E+01	ND				ND				ND			
Methylene chloride	mg/kg	NA	8.41E+01	2.30E-03	B			2.40E-03	B			2.80E-03	B		
SEMIVOLATILE ORGANIC COMPOUNDS															
Di-n-butyl phthalate	mg/kg	NA	7.80E+02	8.20E-02	J			ND				ND			
bis(2-Ethylhexyl)phthalate	mg/kg	NA	4.52E+01	7.80E-02	B			8.30E-02	B			7.50E-02	B		

Analyses performed by Quanterra Environmental Services using U.S. Environmental Protection Agency (EPA) SW-846 analytical methods, including Update III methods where applicable.

^a Bkg - Background. Concentration listed is two times (2x) the arithmetic mean of background metals concentration given in Science Applications International Corporation (1998), *Final Background Metals Survey Report, Fort McClellan, Alabama*, July.

^b Residential human health site-specific screening level (SSSL) as given in IT Corporation (2000b), *Final Human Health and Ecological Screening Values and PAH Background Summary Report, Fort McClellan, Calhoun County, Alabama*, July.

B - Analyte detected in laboratory or field blank at concentration greater than the reporting limit (and greater than zero).

J - Result is greater than the method detection limit but less than or equal to the reporting limit.

mg/kg - Milligrams per kilogram.

NA - Not available.

ND - Not detected.

Qual - Data validation qualifier.

Table 5-3

**Groundwater Analytical Results
Motor Pool Area 1300, Parcel 143(7)
Fort McClellan, Calhoun County, Alabama**

Sample Location Sample Number Sample Date				PPMP-143-GP01 KP3001 5-Feb-99				PPMP-143-GP02 KP3002 19-Feb-99				PPMP-143-GP03 KP3003 19-Feb-99				PPMP-143-GP04 KP3006 4-Feb-99				PPMP-143-GP05 KP3007 22-Feb-99				
Parameter	Units	BKG ^a	SSSL ^b	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL	
METALS																								
Aluminum	mg/L	2.34E+00	1.56E+00	7.73E-01				1.95E-01	B			5.85E-02	B			3.44E+00		YES	YES	6.14E+00		YES	YES	
Barium	mg/L	1.27E-01	1.10E-01	1.04E-01	J			4.44E-02	J			7.73E-02	J			7.75E-02	J			1.69E-01	J	YES	YES	
Calcium	mg/L	5.65E+01	NA	3.48E+01				9.48E+00				1.30E+01				1.03E+01				2.23E+01				
Chromium	mg/L	NA	4.69E-03	ND				ND				ND				6.00E-03	J		YES	7.10E-03	J		YES	
Copper	mg/L	2.55E-02	6.26E-02	ND				ND				ND				4.60E-03	J			5.60E-03	B			
Iron	mg/L	7.04E+00	4.69E-01	9.30E-01			YES	2.55E-01				ND				4.91E+00			YES	7.54E+00		YES	YES	
Lead	mg/L	7.99E-03	1.50E-02	ND				ND				ND				3.40E-03				3.00E-03				
Magnesium	mg/L	2.13E+01	NA	1.62E+01				5.48E+00				6.74E+00				6.81E+00				1.18E+01				
Manganese	mg/L	5.81E-01	7.35E-02	2.43E-01			YES	1.37E-01			YES	1.66E-01			YES	3.09E-01			YES	2.89E-01			YES	
Mercury	mg/L	NA	4.60E-04	7.40E-05	J			ND				ND				5.30E-05	J			ND				
Nickel	mg/L	NA	3.13E-02	ND				ND				ND				1.17E-02	J			1.14E-02	B			
Potassium	mg/L	7.20E+00	NA	1.58E+00	J			7.33E-01	J			1.00E+00	J			1.97E+00	J			2.54E+00	J			
Sodium	mg/L	1.48E+01	NA	1.66E+01		YES		4.85E+00	J			3.50E+00	J			5.63E+00				8.95E+00				
Vanadium	mg/L	1.70E-02	1.10E-02	ND				ND				ND				ND				1.03E-02	J			
Zinc	mg/L	2.20E-01	4.69E-01	ND				ND				ND				1.84E-02	J			2.24E-02				
VOLATILE ORGANIC COMPOUNDS																								
1,2,3-Trichlorobenzene	mg/L	NA	1.32E-03	ND				4.90E-04	B			ND				ND				ND				
1,2,4-Trichlorobenzene	mg/L	NA	1.35E-02	ND				3.80E-04	B			ND				ND				ND				
Acetone	mg/L	NA	1.56E-01	ND				ND				ND				ND				1.50E-03	B			
Chloroform	mg/L	NA	1.15E-03	ND				1.30E-03			YES	1.10E-03				ND				ND				
Chloromethane	mg/L	NA	3.92E-03	ND				2.00E-04	B			ND				ND				ND				
Hexachlorobutadiene	mg/L	NA	8.30E-04	ND				2.70E-04	B			ND				ND				ND				
Methylene chloride	mg/L	NA	7.85E-03	1.20E-03	B			ND				ND				1.00E-03	B			ND				
Toluene	mg/L	NA	2.59E-01	ND				6.00E-04	J			ND				ND				3.50E-04	J			
n-Butylbenzene	mg/L	NA	9.57E-03	ND				1.70E-04	J			ND				ND				ND				

Analyses performed by Quanterra Environmental Services using U.S. Environmental Protection Agency (EPA) SW-846 analytical methods, including Update III methods where applicable.

^a Bkg - Background. Concentration listed is two times (2x) the arithmetic mean of background metals concentration given in Science Applications International Corporation (1998), *Final Background Metals Survey Report, Fort McClellan, Alabama*, July.

^b Residential human health site-specific screening level (SSSL) as given in IT Corporation (2000b), *Final Human Health and Ecological Screening Values and PAH Background Summary Report, Fort McClellan, Calhoun County, Alabama*, July.

B - Analyte detected in laboratory or field blank at concentration greater than the reporting limit (and greater than zero).

J - Result is greater than the method detection limit but less than or equal to the reporting limit.

mg/L - Milligrams per liter.

NA - Not available.

ND - Not detected.

Qual - Data validation qualifier.

Semivolatile Organic Compounds. Thirteen SVOCs were detected in surface and depositional soil samples collected at Motor Pool Area 1300, Parcel 143(7). Six of the seven bis(2-ethylhexyl)phthalate results were flagged with a 'B' data qualifier, signifying that bis(2-ethylhexyl)phthalate was also detected in an associated laboratory or field blank. The remaining SVOC results were flagged with a 'J' data qualifier, signifying that the results were greater than the method detection limit but less than the RL.

The concentration of benzo(a)pyrene exceeded the SSSL at one sample location (PPMP-143-GP07). None of the detected SVOCs was present at a concentration exceeding ESVs.

5.2 Subsurface Soil Analytical Results

Seven subsurface soil samples were collected for chemical analysis at Motor Pool Area 1300, Parcel 143(7). Subsurface soil samples were collected at depths greater than 1 foot bgs at the locations shown on Figure 3-1. Analytical results were compared to residential human health SSSLs and metals background screening values, as presented in Table 5-2.

Metals. Twenty-one metals were detected in subsurface soil samples collected at Motor Pool Area 1300, Parcel 143(7). Sample location PPMP-143-GP01 contained all twenty-one metals, and PPMP-143-GP05 contained twenty metals.

The concentrations of five metals (aluminum, arsenic, chromium, iron, and manganese) exceeded SSSLs. Of these metals, the concentrations of aluminum (at three locations) and iron (at one location) also exceeded the respective background screening values. However, with the exception of the iron concentration at PPMP-143-GP01, the results were within the range of background concentrations.

Volatile Organic Compounds. Four VOCs (acetone, bromomethane, chloromethane, and methylene chloride) were detected in subsurface soil samples collected at Motor Pool Area 1300, Parcel 143(7). The bromomethane, chloromethane, and methylene chloride results were flagged with a 'B' data qualifier, signifying that these compounds were also detected in an associated laboratory or field blank.

The VOC concentrations in subsurface soils were below SSSLs.

Semivolatile Organic Compounds. Di-n-butyl phthalate and bis(2-ethylhexyl)phthalate were detected in subsurface soil samples collected at Motor Pool Area 1300, Parcel 143(7). The bis(2-ethylhexyl)phthalate results were flagged with a 'B' data qualifier, signifying that this compound was also detected in an associated laboratory or field blank.

The di-n-butyl phthalate and bis(2-ethylhexyl)phthalate concentrations were below SSSLs.

5.3 Groundwater Analytical Results

Groundwater samples were collected from five temporary monitoring wells at Motor Pool Area 1300, Parcel 143(7). The well/groundwater sampling locations are shown on Figure 3-1.

Analytical results were compared to residential human health SSSLs and metals background screening values, as presented in Table 5-3.

Metals. Fifteen metals (aluminum, barium, calcium, chromium, copper, iron, lead, magnesium, manganese, mercury, nickel, potassium, sodium, vanadium, and zinc) were detected in groundwater samples collected at Motor Pool Area 1300, Parcel 143(7). Sample locations PPMP-143-GP04 and PPMP-143-GP05 each contained fourteen of the fifteen detected metals.

The concentrations of five metals (aluminum, barium, chromium, iron, and manganese) exceeded SSSLs. Of these metals, aluminum (at sample locations PPMP-143-GP04 and PPMP-143-GP05), barium (at PPMP-143-GP05), and iron (at PPMP-143-GP05) concentrations also exceeded their respective background screening values. However, the concentrations of these metals were within the range of background concentrations.

Volatile Organic Compounds. Nine VOCs were detected in groundwater samples collected at Motor Pool Area 1300, Parcel 143(7). The 1,2,3-trichlorobenzene, 1,2,4-trichlorobenzene, acetone, chloromethane, hexachlorobutadiene, and methylene chloride results were flagged with a 'B' data qualifier, signifying that these compounds were also detected in an associated laboratory or field blank. Seven of the nine detected VOCs were present in the sample collected at PPMP-143-GP02. None of the remaining samples contained more than two of the detected VOCs.

The concentration of chloroform (0.0013 milligrams per liter [mg/L]) exceeded the SSSL (0.00115 mg/L) at one sample location (PPMP-143-GP02).

Semivolatile Organic Compounds. SVOCs were not detected in the groundwater samples collected at Motor Pool Area 1300, Parcel 143(7).

6.0 Summary, Conclusions, and Recommendations

IT, under contract with USACE, completed an SI at Motor Pool Area 1300, Parcel 143(7), at FTMC in Calhoun County, Alabama. The SI was conducted to determine whether chemical constituents are present at the site and, if present, whether the concentrations present an unacceptable risk to human health or the environment. The SI at Motor Pool Area 1300, Parcel 143(7), consisted of the sampling and analysis of seven surface soil samples, seven subsurface soil samples, one depositional soil sample, and five groundwater samples. In addition, five temporary monitoring wells were installed in the residuum groundwater zone to facilitate groundwater sample collection and provide site-specific geological and hydrogeological characterization information.

The analytical results from the SI indicate that metals, VOCs, and SVOCs were detected in the environmental media sampled. To evaluate whether the detected constituents present an unacceptable risk to human health or the environment, the analytical results were compared to the human health SSSLs, ESVs, and background screening values for FTMC. The SSSLs and ESVs were developed by IT for human health and ecological risk evaluations as part of the ongoing SIs being performed under the BRAC Environmental Restoration Program at FTMC. Additionally, metal results exceeding SSSLs and ESVs were compared to media-specific background screening values (SAIC, 1998), and SVOC concentrations exceeding SSSLs and ESVs in surface and depositional soils were compared to PAH background screening values (IT, 2000b).

Although the parcel is projected to be transferred to the Alabama National Guard, the analytical data were screened against residential human health SSSLs to evaluate the site for possible unrestricted future use. In soils, the concentrations of five metals (aluminum, arsenic, chromium, iron, and manganese) exceeded SSSLs. However, with the exception of iron in one subsurface soil sample, the concentrations of these metals were below the respective background concentrations and/or within the range of background values. The concentration of the SVOC benzo(a)pyrene (0.098 mg/kg) marginally exceeded the SSSL (0.085 mg/kg) in one surface soil sample but was below its background screening value. In groundwater, the concentrations of aluminum, barium, and iron exceeded SSSLs and the respective background concentrations. However, the concentrations of these metals were within the range of background values. In addition, the concentration of chloroform (0.0013 mg/L) marginally exceeded the SSSL (0.00115

mg/L) in one groundwater sample. Given the low concentrations and limited distribution, the metals and organic constituents detected in site media do not pose an unacceptable risk to human health.

Mercury and zinc were detected in one surface soil sample each at concentrations exceeding their respective ESVs and the range of background values. However, the potential impact to ecological receptors is expected to be minimal, based on the existing viable habitat and site conditions. The fenced site is located in a well-developed area consisting of buildings, pavement, and gravel interspersed with minimal grassy areas. The site is projected for future use by the Alabama National Guard. Viable ecological habitat is presently limited and is not expected to increase in the future land-use scenario. Consequently, the potential threat to ecological receptors is expected to be low.

Based on the results of the SI, past operations at Motor Pool Area 1300, Parcel 143(7), do not appear to have adversely impacted the environment. The metals and organic compounds detected in site media do not pose an unacceptable risk to human health or the environment. Therefore, IT recommends “No Further Action” and unrestricted land reuse at Motor Pool Area 1300, Parcel 143(7).

7.0 References

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APPENDIX A

**SAMPLE COLLECTION LOGS AND
ANALYSIS REQUEST/CHAIN-OF-CUSTODY RECORDS**

APPENDIX B

BORING LOGS AND WELL CONSTRUCTION LOGS

APPENDIX C
WELL DEVELOPMENT LOGS

APPENDIX D
SURVEY DATA

APPENDIX E

SUMMARY OF VALIDATED ANALYTICAL DATA

APPENDIX F

DATA VALIDATION SUMMARY REPORT

APPENDIX G
VARIANCES

APPENDIX H

SUMMARY STATISTICS FOR BACKGROUND MEDIA, FORT McCLELLAN, ALABAMA