

**Final
Site-Specific Field Sampling Plan Addendum**

**Supplemental Site Investigation
Former Motor Pool Area 3100
Parcels 146(7), 212(7), 24(7), 25(7), and 73(7)**

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Calhoun County, Alabama**

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List of Acronyms

See Attachment 1, List of Abbreviations and Acronyms.

1.0 Introduction

The Former Motor Pool Area 3100, Parcels 146(7), 212(7), 24(7), 25(7), and 73(7) (hereafter referred to as Former Motor Pool Area 3100, Parcel 146[7]), (Figure 1-1) was identified as an area to be investigated prior to property transfer. The site was identified as a Category 7 site in the environmental baseline survey (Environmental Science and Engineering, 1998). Category 7 sites are areas that are not evaluated and/or require further evaluation. A site-specific field sampling plan (SFSP) attachment and a site-specific safety and health plan (SSHP) attachment were finalized in September 1998 to complete a site investigation (SI). The SI included field work to collect six surface soil samples, thirteen subsurface soil samples, seven groundwater samples, and one depositional soil sample to determine whether potential site-specific chemicals were present at concentrations that would present an unacceptable risk to human health or the environment. The SI analytical results were compared to human health site-specific screening levels (SSSL), ecological screening values (ESV), and background screening values for Fort McClellan (FTMC). The SSSLs and ESVs were compiled by IT Corporation (IT) as part of the human health and ecological risk evaluations associated with site investigations being conducted under the Base Realignment and Closure (BRAC) environmental restoration program at FTMC. Based on the comparisons of the analytical data to the SSSLs, a supplemental SI is required to determine the horizontal and vertical extent of groundwater contamination.

This addendum to the SFSP attachment will be used in conjunction with SSHP, the installation-wide work plan (IT, 1998a), and installation-wide sampling and analysis plan (SAP) (IT, 1998b). The SAP includes the installation-wide safety and health plan, waste management plan, and quality assurance plan. Site-specific hazard analyses are included in the SSHP.

This addendum to the SFSP attachment for FTMC has been prepared to provide technical guidance and rationale for sample collection and analysis at the Former Motor Pool Area 3100, Parcel 146(7) (Figure 1-1). IT will collect samples at this site as part of a supplemental SI effort. The purpose of the supplemental SI is to define the horizontal and vertical extent of volatile organic compounds (VOC), specifically benzene, in groundwater. The proposed supplemental SI field activities are based on the discussions and site visit on May 10, 2000 with Alabama Department of Environmental Management, U.S. Environmental Protection Agency, Region IV, and the U.S. Army Corps of Engineers, Mobile District.

2.0 Summary of Site Investigations

This section summarizes the SI activities conducted by IT at the Former Motor Pool Area 3100, Parcel 146(7), including environmental sampling and analysis, and monitoring well installation activities.

2.1 Environmental Sampling

The environmental sampling performed during the SI at the Former Motor Pool Area 3100, Parcel 146(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 the on-site geologist based on the sampling rationale, presence of surface structures, site topography, and buried and overhead utilities. Analytical results were compared to residential human health SSSLs, ESVs, and background screening values (metals and semivolatile organic compounds [SVOC]), as presented in Tables 2-1 through 2-3. Sample locations are presented on Figure 2-1. Sample locations exceeding the SSSLs are presented on Figures 2-2 and 2-3.

2.2 Surface and Depositional Soil Sampling

Six surface soil samples and one depositional soil sample were collected for chemical analysis at the Former Motor Pool Area 3100, Parcel 146(7). Surface and depositional soil samples were collected from the upper 1 foot of soil at the locations shown on Figure 2-1. As shown on Table 2-1, four metals and one SVOC exceeded the SSSLs and background concentrations. Samples with analytical results exceeding the SSSLs are presented on Figure 2-2.

Metals. The concentrations of iron (FTA-146-GP05 and FTA-146-GP07), arsenic (FTA-146-GP07 and FTA-146-GP08), manganese (FTA-146-DEP01), and chromium (FTA-146-GP07) exceeded residential human health SSSLs and background concentrations.

Semivolatile Organic Compounds. Fourteen SVOCs were detected in surface and depositional soil samples collected at Parcel 146(7). Benzo(a)pyrene (FTA-146-GP05, FTA-146-GP06, and FTA-146-GP09) was the only SVOC detected at concentrations exceeding residential human health SSSLs.

Volatile Organic Compounds. Fourteen VOCs were detected in surface soil samples. None of the VOCs were detected at concentrations exceeding SSSLs.

2.3 Subsurface Soil Sampling

Thirteen subsurface soil samples were collected for chemical analysis at the Former Motor Pool Area 3100, Parcel 146(7) as shown on Figure 2-1. Subsurface soil samples were collected in accordance with the direct-push sampling procedures specified in Section 4.9.11 of the SAP (IT, 2000). Analytical results were compared to the residential human health SSSLs and background concentrations (Table 2-2). Sample locations with analytical results exceeding the SSSLs are presented on Figure 2-2.

Metals. The concentrations of aluminum (FTA-146-GP08 and FTA-146-GP11), arsenic (FTA-146-GP07, FTA-146-GP08, and FTA-146-GP09), chromium (FTA-146-GP07), iron (FTA-146-GP05, FTA-146-GP07, FTA-146-GP08, FTA-146-GP09, and FTA-146-GP10), manganese (FTA-146-GP09), and nickel (FTA-146-GP09) exceeded residential human health SSSLs and background concentrations.

Semivolatile Organic Compounds. Seventeen SVOCs were detected in subsurface soil samples collected at Parcel 146(7). Benzo(a)pyrene (FTA-146-GP12) was the only SVOC detected at concentrations exceeding residential human health SSSLs.

Volatile Organic Compounds. Twenty VOCs were detected in surface soil samples. None of the VOCs were detected at concentrations exceeding SSSLs.

2.4 Groundwater Sampling

Seven temporary wells were sampled at the Former Motor Pool Area 3100, Parcel 146(7). The well/groundwater sample locations are shown on Figure 2-1. Analytical results were compared to the human health SSSLs and metals background screening values (Table 2-3). Sample locations with analytical results exceeding the SSSLs are presented on Figure 2-3.

Metals. The concentrations of four metals, including barium (FTA-146-GP05, FTA-146-GP06, and FTA-146-GP07), cadmium (FTA-146-GP09), manganese (FTA-146-GP06 and FTA-146-GP07), and thallium (FTA-146-GP02, FTA-146-GP07, FTA-146-GP09, and FTA-146-GP10), exceeded residential human health SSSLs and background concentrations in groundwater at Parcel 146(7).

Semivolatile Organic Compounds. Di-n-butyl phthalate was the only SVOC detected in groundwater at Parcel 146(7); however, the concentrations did not exceed residential human health SSSLs.

Volatile Organic Compounds. Eight VOCs were detected in groundwater at Parcel 146(7). Benzene (FTA-146-GP02) was the only VOC detected at concentrations exceeding residential human health SSSLs.

2.5 Water Level Measurements and Groundwater Flow

The depth to groundwater was measured in seven temporary wells at the Former Motor Pool Area 3100, Parcel 146(7) following procedures outlined in Section 4.18 of the SAP (IT, 2000). Measurements were referenced to the top of the polyvinyl chloride (PVC) stickup. A groundwater elevation map, constructed from March 13, 2000 data, is presented as Figure 2-4. Based on the March groundwater levels, horizontal groundwater flow is to the northwest.

3.0 Proposed Field Activities

3.1 Environmental Sampling

The proposed environmental sampling program during the supplemental SI at the Former Motor Pool Area 3100, Parcel 146(7) includes the collection of nine groundwater samples for chemical analysis. These samples will be collected and analyzed to provide data in order to determine the horizontal and vertical extent of benzene contamination in groundwater.

3.2 Residuum Monitoring Well Installation

Eight permanent residuum monitoring wells will be installed at the Former Motor Pool Area 3100, Parcel 146(7). One permanent residuum monitoring well will be installed adjacent to each existing temporary well FTA-146-GP02 and FTA-146-GP08. The temporary wells will be abandoned in accordance with Alabama Department of Environmental Management guidelines. The proposed permanent residuum monitoring well locations are shown on Figure 3-1. Well location rationale is presented in Table 3-1. The exact monitoring well locations will be determined in the field by the on-site geologist based on actual field conditions.

Soil samples will be collected at 5-foot intervals to the total depth of the hole during hollow-stem auger drilling. Samples will be collected using a 2-inch diameter or-larger split-spoon sampler. Lithologic samples will be collected for all monitoring wells during drilling to provide a detailed lithologic log. All soil borings will be logged in accordance with American Society for Testing and Materials Method D 2488 using the Unified Soil Classification System. All soil samples will be screened in the field using a photoionization detector to verify the potential presence of contamination. None of the subsurface soil samples will be sent to the laboratory. The permanent residuum monitoring wells will be drilled, installed, and developed as specified in Section 4.8 and Appendix C of the SAP (IT, 2000). Groundwater samples will not be collected from residuum wells for a period of at least 14 days after well development.

3.3 Bedrock Monitoring Well Installation

One permanent bedrock monitoring well will be installed at the Former Motor Pool Area 3100, Parcel 146(7) adjacent to proposed residuum well FTA-146-MW02. The proposed bedrock monitoring well location is shown on Figure 3-1. The permanent bedrock monitoring well will be drilled, installed, and developed as specified in Section 4.8 and Appendix C of the SAP (IT, 2000).

The bedrock monitoring well borehole will be drilled using a combination of air rotary drilling and bedrock coring techniques. A drill rig able to employ both methods will be used, if possible, to minimize mobilization costs. The bedrock monitoring wells will be drilled a minimum of 20 feet into competent bedrock.

Bedrock monitoring well FTA-146-MW09 will be installed prior to installation of the residuum wells. Split-spoon samples will not be collected from the bedrock borings. An air rotary rig with a 12-inch percussion bit or rotary bit will be used to drill the borehole from land surface to 5 feet into competent bedrock. An 8-inch ID carbon steel International Pipe Standard (IPS) outer casing will then be installed into the borehole from land surface to 5 feet into bedrock. The depth of the 8-inch carbon steel casing is anticipated to be approximately 45 feet below ground surface, based on the refusal depth of nearby existing monitoring wells. A minimum of 2-inch annular space between the outer casing and borehole wall will be required. The 8-inch carbon steel outer casing will be grouted in-place using a tremie pipe suspended in the annulus outside of the casing. Bentonite-cement grout will be mixed using approximately 6.5 to 7 gallons of water, and 5 pounds of bentonite per 94 pound bag of Type I Portland cement. After the grout has cured a minimum of 48 hours, the borehole will be advanced an additional 15 feet utilizing a PQ wireline core barrel, which will be used to collect core samples continuously. The hole depth into competent bedrock will be increased if groundwater is not encountered. After completion of core sample collection, a 7 7/8-inch air percussion bit will be used to ream the hole a minimum of 15 feet below the bottom of the surface casing and into competent bedrock. The compressor on the drill rig will be equipped with an air filter between the compressor and the drill bit. Water will be the only lubricant allowed during drilling operations.

A 4-inch monitoring well will be installed inside the outer casing at the proposed well location. The well casing diameter will consist of new, 4-inch ID, Schedule 80, threaded, flush-joint, PVC pipe. Attached to the bottom of the well casing will be a section of new threaded, flush joint 0.010-inch continuous wrap PVC well screen, approximately 10 to 15 feet long. Attached to the bottom of the well will be a sump, approximately 3 to 5 feet long, composed of new, 4-inch ID, Schedule 80, threaded, flush joint PVC pipe. After the casing and screen material are lowered into the boring, a gravel pack will be installed around the well screen and the inside casing will be grouted from the top of the gravel pack to land surface. The gravel pack will be tremied into place from the bottom of the sump to approximately 5 feet above the top of the screen. The gravel pack will consist of 20/40 silica sand. A bentonite seal, approximately 5 feet thick, will be placed above the gravel pack. The remaining annular space will be grouted with a bentonite-cement mixture seal to ground surface. The bedrock monitoring well will be developed as

specified in Section 4.8 and Appendix C of the SAP (IT, 2000). Groundwater samples will not be collected from the bedrock well for a period of 14 days after well development.

3.4 Groundwater Sampling and Rationale

Groundwater samples will be collected from the residuum and bedrock wells installed at the site. Groundwater sampling rationale is presented in Table 3-1. The groundwater sample designations and required quality assurance/quality control sample quantities are listed in Table 3-2. The groundwater samples will be collected in accordance with the procedures specified in the SAP (IT, 2000).

3.5 Investigative-Derived Waste Management and Disposal

Investigative-derived waste (IDW) will be managed and disposed of as outlined in Appendix D of the SAP (IT, 2000). The IDW expected to be generated from the field sampling at FTMC will consist of soils from the hollow-stem auger sampling, purge water from monitoring well development and sampling activities, decontamination fluids, spent well materials, and personal protective equipment. The IDW will be staged inside the fenced area near Buildings 335 and 336 while awaiting final disposal.

3.6 Site-Specific Safety and Health

Health and safety requirements for the field activities are provided in the SSHP attachment for the Former Motor Pool Area 3100, Parcel 146(7) (IT, 1998b). The SSHP attachment will be used in conjunction with the installation-wide safety and health plan.

4.0 Project Schedule

The project schedule for the supplemental SI activities will be provided by the IT Project Manager to BRAC Cleanup Team on a monthly basis.

5.0 References

Environmental Science and Engineering, Inc., 1998, *Final Environmental Baseline Survey, Fort McClellan, Alabama*, prepared for U.S. Army Environmental Center, Aberdeen Proving Ground, Maryland, January.

IT Corporation (IT), 2000, *Final Installation-Wide Sampling and Analysis Plan, Fort McClellan, Calhoun County, Alabama*, March.

IT Corporation (IT), 1998a, *Final Installation-Wide Work Plan, Fort McClellan, Calhoun County, Alabama*, October.

IT Corporation (IT), 1998b, *Final Site-Specific Field Sampling Plan for the Former Motor Pool Area 3100, Parcels 146(7), 212(7), 24(7), 25(7), and 73(7)*, September.

ATTACHMENT 1

LIST OF ABBREVIATIONS AND ACRONYMS