

**IT Corporation**

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*A Member of The IT Group*

July 6, 2001

IT-MC-CK10-0119  
Project No. 796887

Mr. Ellis Pope  
U.S. Army Corps of Engineers  
Mobile District  
Attn: CESAM-EN-GE (Pope)  
109 St. Joseph Street  
Mobile, AL 36602

Contract:       **Contract No. DACA21-96-D-0018/CK10**  
                     **Fort McClellan, Alabama**

Subject:       **Final Site-Specific Work Plan for the Groundwater Investigation at the Burial**  
                     **Mound at Rideout Field, Parcel 202Q-RD-Pelham Range**

Dear Mr. Pope:

This letter serves to document our proposed field activities at the Burial Mound at Rideout Field (Parcel 202Q-RD). The proposed field activities and rationale were discussed at a meeting on April 11 and 12, 2000 with representatives of Fort McClellan, Nuclear Regulatory Commission (NRC), United States Environmental Protection Agency (EPA), Alabama Department of Health, and IT Corporation. Additional discussions on the proposed field activities and rationale were held during the May 24, 2001 meeting with representatives of Fort McClellan, U.S. Army Corps of Engineers, EPA, and IT Corporation. During the May 24, 2001 meeting, EPA requested a fourth monitoring well to be installed approximately 650 feet south of the Burial Mound.

**Background**

The Burial Mound at Rideout Field is located in the western part of Pelham Range in Training Area 24C (Figure 1). Rideout Field was used as part of the Chemical School's Radiological Survey Training Facility from 1965-1972 and as a burial site for radioactive material. The burial site has since been excavated, and the soils have been piled in an area that is known as the Burial Mound.



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June 22, 2001

IT-MC-CK10-0119  
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Dear Mr. Pope:

This letter serves to document our proposed field activities at the Burial Mound at Rideout Field (Parcel 202Q-RD). The proposed field activities and rationale were discussed at a meeting on April 11 and 12, 2000 with representatives of Fort McClellan, Nuclear Regulatory Commission (NRC), United States Environmental Protection Agency (EPA), Alabama Department of Health, and IT Corporation. Additional discussions on the proposed field activities and rationale were held during the May 24, 2001 meeting with representatives of Fort McClellan, U.S. Army Corps of Engineers, EPA, Alabama Department of Health, and IT Corporation. During the May 24, 2001 meeting, EPA requested a fourth monitoring well to be installed approximately 650 feet south of the Burial Mound.

**Background**

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The site where the Burial Mound is located was part of the Rideout Field Survey Training Area at the north end of Rideout Field. The Rideout Field Survey Training Area has been cleared and leveled and was designated as a burial ground in 1957. Radioactive waste from the waste burial ground on Main Post (Iron Mountain site) was transferred to Pelham Range and buried at the site during the same year. Burial of waste, mostly laboratory waste (Cs-137, Co-60 and possibly Sr-90) continued through the 1960s. In 1972-73, the site was cleared, and the mound was created during the excavation of the burial site (Response by John May, U.S. Army Chemical School).

Radioactive waste from Rattlesnake Gulch (now known as Iron Mountain) was also reportedly buried at the Burial Mound. Radioactive materials used in training included Co-60, Co-137 and Sr-90 (Roy F. Weston, Inc., *Enhanced Preliminary Assessment*, December 1990).

Items disposed at the Burial Mound include leaking Co-60 sources that were routinely buried in cut-down 55-gallon drums and soils contaminated from leaking Co-60 sources (U.S. Army Center for Health Promotion and Preventative Medicine, [CHPPM], *Draft Preliminary Assessment No. 38-EH-1775-99, Fort McClellan Army National Guard Training Center, Fort McClellan, Alabama*, June, 1999).

The current footprint of the Burial Mound is approximately 50 feet wide by 80 feet long. The burial mound is surrounded by a strand of rope that supports "Do Not Enter" signs. Radioactive wastes are recorded as being buried at a depth of 6 to 8 feet (CHPPM, 1999).

In 1996, CHPPM conducted an Industrial Radiation Study to assess radiation health hazards associated with potential contamination and to determine if residual radioactivity at the Burial Mound site was in compliance with U.S. Nuclear Regulatory Commission guidance for release to unrestricted use. Results of the study indicated residual contamination above both the Co-60 and Cs-137 activity in soil release criteria, and subsurface measurements indicative of buried radioactive sources or substantial contamination pockets in the subsurface environment. CHPPM recommended the excavation, removal, and proper disposal of the surface and subsurface contamination identified and the performance of final status survey of the Burial Mound to support release of this area for unrestricted use.

The future land use of the property is projected as a training area for the Alabama National Guard. The NRC has requested that an evaluation of groundwater at the site be conducted to determine whether or not Cr-60, Cs-137, and Sr-90 are present in the groundwater downgradient of the Burial Mound.

### **Field Activities**

IT originally proposed to install three groundwater monitoring wells at the Burial Mound at Rideout Field as discussed at the April 11 and 12, 2000 meeting. As a result of further discussion at the May 24, 2001 BCT meeting, EPA requested a fourth groundwater monitoring well at the Burial Mound at

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Rideout Field. One of the four proposed groundwater monitoring wells will be installed upgradient, and the remaining three groundwater monitoring wells will be installed downgradient of the Burial Mound at Rideout Field, in order to determine the presence or absence of gamma-emitting radionuclides. The proposed groundwater monitoring well locations are shown on Figure 2. The monitoring wells will be drilled, installed, and developed as specified in Section 4.8 and Appendix C of IT's *Final Installation-Wide Sampling and Analysis Plan (SAP)*, March 2000.

The rationale for the monitoring well locations are presented in Table 1. The monitoring well casing will consist of new 2-inch inside-diameter, Schedule 40, threaded, flush-joint, polyvinyl chloride pipe. Attached to the bottom of the well casing will be a section of new threaded, flush-joint, 0.010-inch continuous wrap polyvinyl chloride well screen, approximately 10 to 20 feet long. The well will be installed so the well screen straddles the water table.

Soil samples for lithology will be collected continuously every 5 feet to the total depth of the hole during hollow-stem auger drilling to provide a detailed lithologic log. The samples will be collected for lithology using a 24-inch-long, 2-inch-or-larger-diameter, split-spoon sampler. The soil borings will be logged in accordance with American Standard for Testing and Materials Method D 2488 using the Unified Soil Classification System. The soil samples will be screened in the field using a photoionization detector. The monitoring wells will be drilled, installed, and developed as specified in Section 4.8 and Appendix C of the SAP (IT, 2000). The exact monitoring well locations will be determined in the field by the on-site geologist, based on actual field conditions.

A health physicist technician (HP Tech) will be on site during the drilling operations. The HP Tech will perform radiological surveys of the general work area during intrusive operations and of the drilling equipment after it is retrieved from the borehole. If readings measure more than 1.5 times the background radiation level, the HP Tech will stop work and notify the senior health physicist and project health and safety officer as specified in the site-specific safety and health plan attachment.

The monitoring well locations and elevations will be surveyed following the methodology outlined in Section 4.17 of the SAP.

At the completion of well installation and development activities, four groundwater samples will be collected. The groundwater sampling rationale are provided in Table 1. The groundwater sample designations, depths, and required QA/QC sample quantities are listed in Table 2.

Groundwater samples will be collected as outlined in Section 4.9.1.4 of the SAP and analyzed for gamma-emitting radionuclides (Table 3). Low-flow groundwater sampling methodology will be used to collect the samples. Equipment decontamination procedures will follow the methodology presented in Section 4.10.1.2 of the SAP.

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Investigative-derived waste generated during well installation and sampling will be managed in accordance with the procedures outlined in Appendix D of the SAP.

The presence of unexploded ordnance (UXO) is possible at the Burial Mound at Rideout Field. Therefore, IT will conduct UXO avoidance activities as outlined in Appendix E of the SAP and the attached Site-Specific UXO Safety Plan prior to initiating intrusive field activities at the Burial Mound at Rideout Field. In addition, IT has attached a Site-Specific Health and Safety Plan for use during field activities at the Burial Mound. The SSHP has been written to take into account radiological hazards and precautions against exposure to possible radiation.

### **Data Evaluation and Reporting**

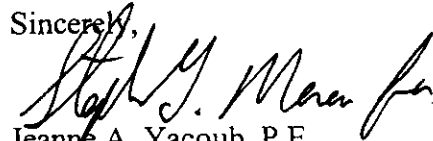
At completion of the field activities, draft and final letter summary reports will be prepared to evaluate the absence or presence of any gamma-emitting radionuclides in the groundwater at the site and to recommend further actions, if appropriate. The data will also be used to determine the depth to water and construct a groundwater contour map. The data generated from the installation and sampling of the four monitoring wells will be reviewed against the applicable federal drinking water guidelines.

### **Schedule**

The project schedule for the field activities will be provided by the IT project manager to the Base Realignment and Closure Cleanup Team.

I have distributed copies of this document according to the distribution list indicated below. If you have any questions, or need further information, please contact me at (770) 663-1429 or Steve Moran at (865) 694-7361.

Sincerely,



Jeanne A. Yacoub, P.E.  
Project Manager

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Attachments

Distribution: Lisa Kingsbury, Fort McClellan (7 copies, 1 CD)  
Philip Stroud, ADEM (1 copy, 1 CD)  
Doyle Brittain, EPA Region IV (1 copy, 1 CD)  
Rick Button, EPA Region IV (1 copy)  
John May, U.S. Army Chemical School (1 copy)  
Mike Styvaert, U.S. Army Headquarters, Industrial Operations Command (1 copy)  
Terry Williams, State of Alabama Department of Public Health (1 copy)  
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J. Tarr (3 copies, 1 CD)  
J. Remo  
A. Mayila (letter only)  
J. Jenkins  
E. Hester (letter only)  
Chemist - Data Management Group (R. McBride)  
Central Files (1 bound, 1 original document and 1 CD)

Table 1

**Sampling Locations and Rationale**  
**Groundwater Investigation at the Burial Mound at Rideout Field - Pelham Range**  
**Fort McClellan, Calhoun County, Alabama**

Sample Location	Sample Media	Sample Location Rationale
RF-MW01	Groundwater	Groundwater monitoring well to be placed on the upgradient, north side of the burial mound. Sample data will indicate if contaminant releases into the environment have occurred from the radioactive waste buried. The monitoring well location will be used to establish a local groundwater flow direction and site-specific geology, and provide information on groundwater quality in the residuum aquifer.
RF-MW02	Groundwater	Groundwater monitoring well to be placed on the downgradient, southwest side of the burial mound. Sample data will indicate if contaminant releases into the environment have occurred from the potential radioactive waste in the Burial Mound. The monitoring well location will be used to establish a local groundwater flow direction and site-specific geology, and provide information on groundwater quality in the residuum aquifer.
RF-MW03	Groundwater	Groundwater monitoring well to be placed on downgradient, southeast side of the burial mound. Sample data will indicate if contaminant releases into the environment have occurred from the radioactive waste buried. The monitoring well location will be used to establish a local groundwater flow direction and site-specific geology, and provide information on groundwater quality in the residuum aquifer.
RF-MW04	Groundwater	Groundwater monitoring well to be placed downgradient approximately 650 feet south of the burial mound in a topographic low at the direction of EPA. Sample data will indicate if radioactive contaminant releases into the environment have occurred.



Table 2

**Groundwater Sample Designations and QA/QC Sample Quantities**  
**Groundwater Investigation at the Burial Mound at Rideout Field - Pelham Range**  
**Fort McClellan, Calhoun County, Alabama**

Sample Location	Sample Designation	Sample Matrix	Sample Depth (ft)	QA/QC Samples			Analytical Suite
				Field Duplicates	Field Splits	MS/MSD	
RF-MW01	RF-MW01-GW-HV3001-REG	Groundwater	a				Full gamma Scan including Co-60 (DL @ 20 pCi/L) and Cs-137 (DL @ 10 pCi/L) and Sr-90 (DL @ 1 pCi/L)
RF-MW02	RF-MW02-GW-HV3002-REG	Groundwater	a				Full gamma Scan including Co-60 (DL @ 20 pCi/L) and Cs-137 (DL @ 10 pCi/L) and Sr-90 (DL @ 1 pCi/L)
RF-MW03	RF-MW03-GW-HV3003-REG	Groundwater	a	RF-MW03-GW-HV3004-FD			Full gamma Scan including Co-60 (DL @ 20 pCi/L) and Cs-137 (DL @ 10 pCi/L) and Sr-90 (DL @ 1 pCi/L)
RF-MW04	RF-MW04-GW-HV3005-REG	Groundwater	a				Full gamma Scan including Co-60 (DL @ 20 pCi/L) and Cs-137 (DL @ 10 pCi/L) and Sr-90 (DL @ 1 pCi/L)

\* Sample depth will depend on where sufficient first water is encountered to collect a water sample.

FD - Field duplicate.

FS - Field split.

MS/MSD - Matrix spike/matrix spike duplicate.

QA/QC - Quality assurance/quality control.

REG - Field sample.

DL - Detection Limit

Co-60 - Cobalt-60

Cs-137 - Cesium-137

Sr-90 - Strontium-90

pCi/L - Pico curies per liter

Table 3

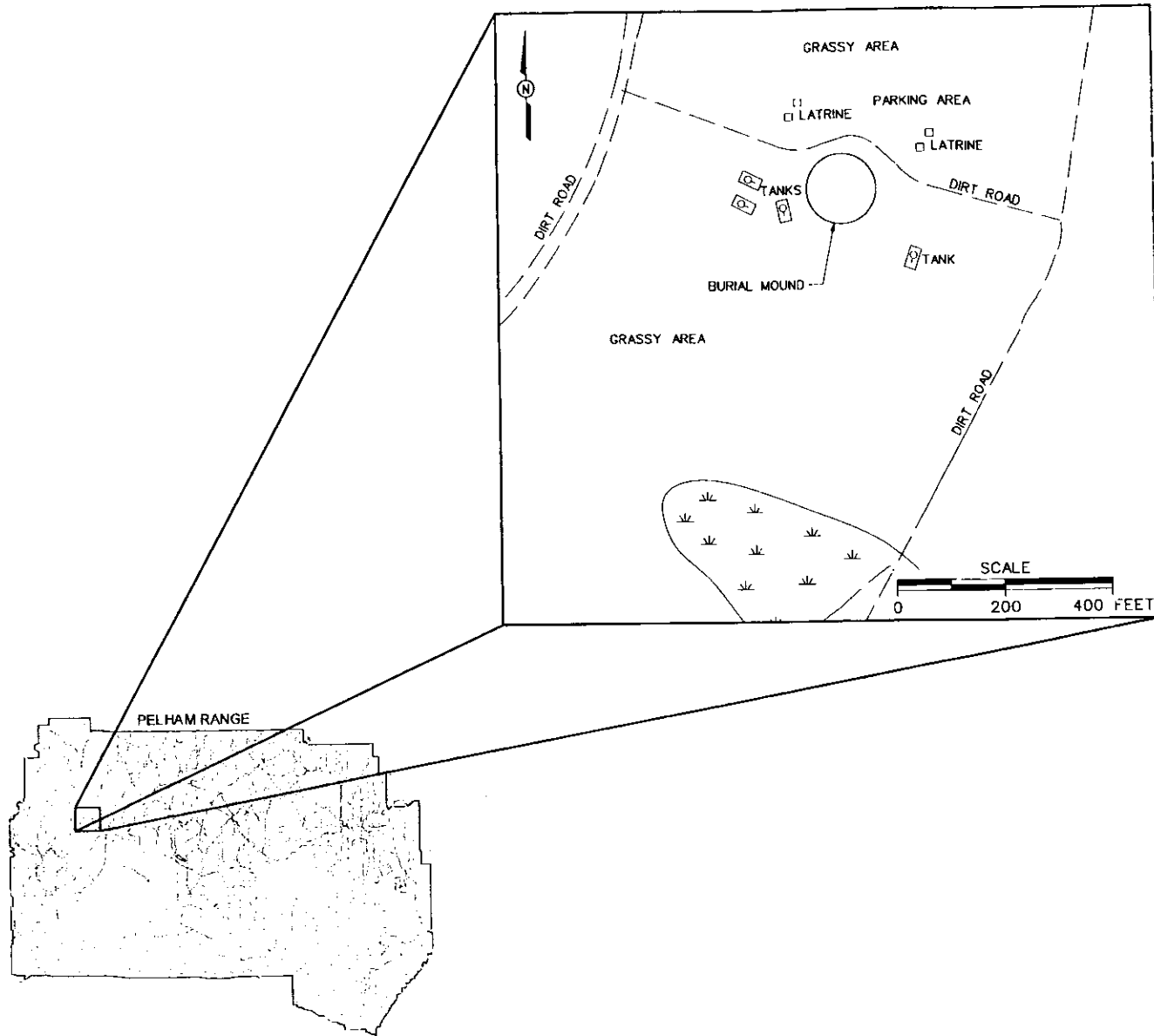
**Analytical Samples**  
**Groundwater Investigation at the Burial Mound at Rideout Field - Pelham Range**  
**Fort McClellan, Calhoun County, Alabama**

Parameters	Analysis Method	Sample Matrix	TAT Needed	Field Samples			QA/QC Samples <sup>a</sup>					EMAX	QA Lab
				No. of Sample Points	No. of Events	No. of Field Samples	Field Dups (10%)	Splits w/ QA Lab (0%)	MS/MSS (0%)	Trip Blank (1/ship)	Eq. Rinse (1/wk/matrix)	Total No. Analysis	Total No. Analysis
Burial Mound at Readout Field: 4 groundwater matrix samples													
Sr-90 (DL @ 1 pCi/L)	EPA 905 0	water	normal	4	1	4	1	0	0	0	0	5	1
Full Gamma Scan including													
Co-60 (DL @ 20 pCi/L) and	EPA 901 1	water	normal	4	1	4	1	0	0	0	0	5	1
Cs-137 (DL @ 10 pCi/L)													
Subtotal:						8	2	0	0	0	0	10	2

<sup>a</sup>Field duplicate samples were calculated as a percentage of the field samples collected per site and were rounded to the nearest whole number.

Ship samples to: EMAX Laboratories, Inc.  
 1835 205th Street  
 Torrance, California 90501  
 Attn: Sampling Receiving/Elizabeth McIntyre  
 Tel: 310-618-8889  
 Fax: 310-618-0818

DL - Detection Limit  
 Co-60 - Cobalt-60  
 Cs-137 - Cesium-137  
 Sr-90 - Strontium-90  
 pCi/L - Picocuries per liter



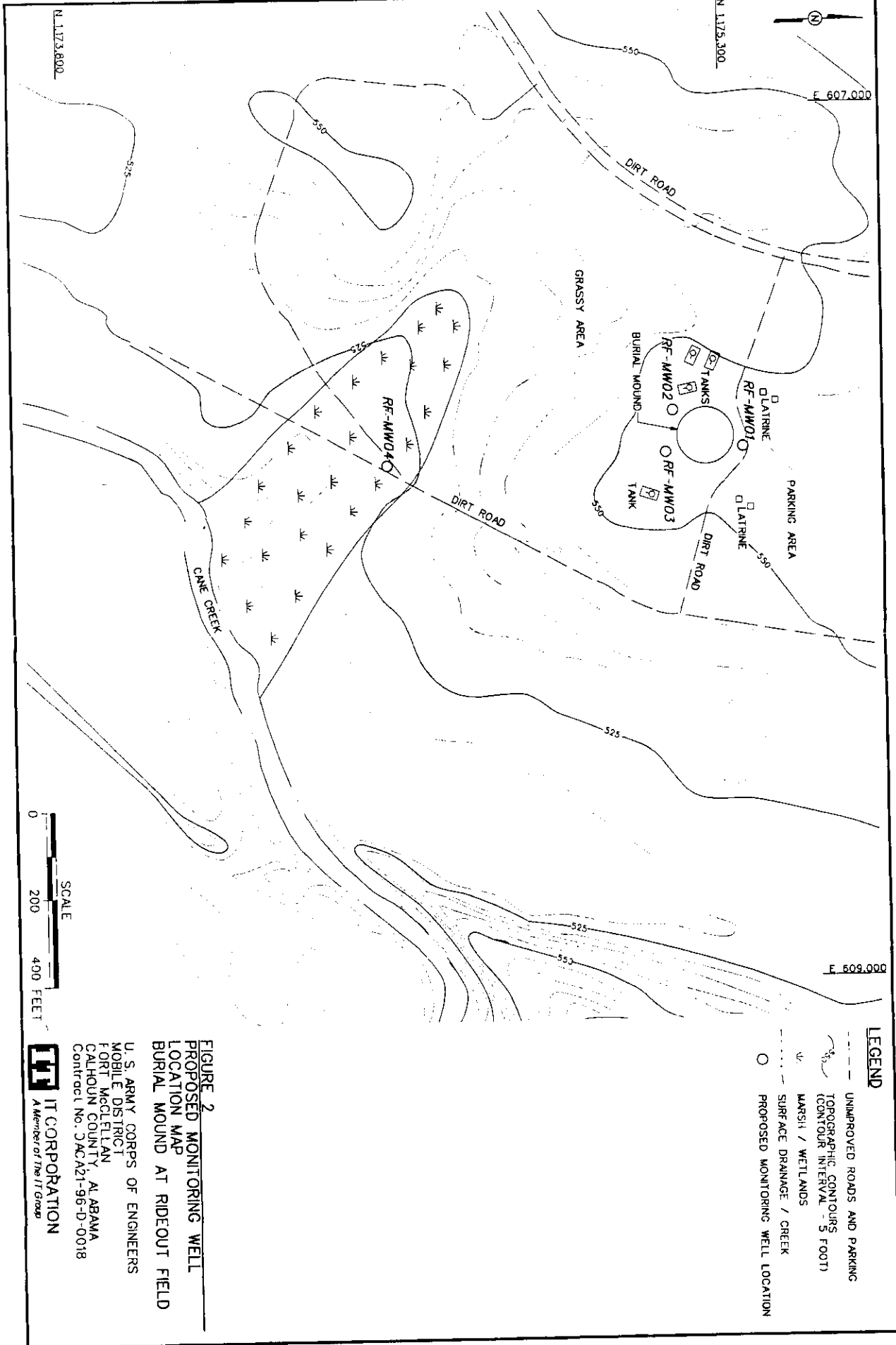
# LEGEND

- UNIMPROVED ROADS AND PARKING
- ▴ MARSH / WETLANDS
- SURFACE DRAINAGE / CREEK

FIGURE 1  
SITE LOCATION MAP  
BURIAL MOUND AT RIDEOUT FIELD

U. S. ARMY CORPS OF ENGINEERS  
MOBILE DISTRICT  
FORT MCLELLAN  
CALHOUN COUNTY, ALABAMA  
Contract No. DACA21-96-D-0018

**IT** IT CORPORATION  
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**ATTACHMENT 1**  
**ABBREVIATIONS AND ACRONYMS**

List of Abbreviations and Acronyms

2,4-D	2,4-dichlorophenoxyacetic acid	CERFA	Community Environmental Response Facilitation Act	DRO	diesel range organics
2,4,5-T	2,4,5-trichlorophenoxyacetic acid	CESAS	Corps of Engineers South Atlantic Savannah	DS	deep (subsurface) soil
2,4,5-TP	silvex	CG	carbonyl chloride (phosgene)	DS2	Decontamination Solution Number 2
3D	3D International Environmental Group	CFC	chlorofluorocarbon	DWEI	drinking water equivalent level
ABS	skin absorption	ch	inorganic clays of high plasticity	E&E	Ecology and Environment, Inc.
AC	hydrogen cyanide	CHPPM	U.S. Army Center for Health Promotion and Preventive Medicine	EBS	environmental baseline survey
ACR2	Amniston and Allen gravelly loams, 2 to 6 percent slopes, eroded	CK	cyanogen chloride	EI/CA	engineering evaluation and cost analysis
ACC2	Amniston and Allen gravelly loams, 6 to 10 percent slopes, eroded	cl	inorganic clays of low to medium plasticity	Elev.	elevation
ACD2	Amniston and Allen gravelly loams, 10 to 15 percent slopes, eroded	CL	chlorinated	EM	electromagnetic
AE2	Amniston and Allen gravelly loams, 15 to 25 percent slopes, eroded	CLP	Contract Laboratory Program	EM31	Geonics Limited EM31 Terrain Conductivity Meter
ACCHH	American Conference of Governmental Industrial Hygienists	CN	chlorosaccharophenone	EM61	Geonics Limited EM61 High-Resolution Metal Detector
ADDEM	Alabama Department of Environmental Management	CNB	chlorosaccharophenone, benzene, and carbon tetrachloride	EOD	explosive ordnance disposal
AEL	airborne exposure limit	CNS	chlorosaccharophenone, chloropicrin, and chloroform	EODT	explosive ordnance disposal team
AHA	ammunition holding area	Co-60	cobalt-60	EPA	U.S. Environmental Protection Agency
AL	Alabama	COC	chain of custody; contaminant of concern	EPC	exposure point concentration
amb	amber	COE	Corps of Engineers	EPRC	Environmental Photographic Interpretation Center
ANAD	Amniston Army Depot	Con	skin or eye contact	ER	equipment, rtmac
APT	armor-piercing tracer	COPC	contaminant of potential concern	ESE	Environmental Science and Engineering, Inc.
AVAR	applicable or relevant and appropriate requirement	COPEC	contaminant of potential environmental concern	ESV	ecological screening value
ASP	ammunition supply point	CRL	certified reporting limit	Exp	explosives
ASR	Archives Search Report	CRZ	contamination reduction zone	E-W	east to west
AST	aboveground storage tank	Co-137	cesium-137	EZ	exclusion zone
ASTM	American Society for Testing and Materials	CS	ortho-chlorobenzylidene-malonitrile	FAR	Federal Acquisition Regulations
AWWSH	American Water Works and Sewer Board	CSEM	conceptual site exposure model	FB	field blank
'B'	Analyte detected in laboratory or field blank at concentration greater than the reporting limit (and greater than zero)	ctr.	container	FD	field duplicate
BCT	BRAC Cleanup Team	CWA	chemical warfare agent	FedEx	Federal Express, Inc.
BEHP	bis(2-ethylhexyl)phthalate	CWM	chemical warfare material; clear, wide mouth	PTE	field flame expedient
BEH	benzofluorobenzene	CX	dichloroformoxime	Fl	filtered
BG	Bacillus globigii	D	duplicate; dilution	Flt	filtered
BGS	below ground surface	DANC	decontamination agent, non-corrosive	FMF 1,300	Former Motor Pool 1300
BHC	benzhexachlorocyclohexane	°C	degrees Celsius	Foster Wheeler	Foster Wheeler Environmental Corporation
bkg	background	°F	degrees Fahrenheit	Fran	fraction
bis	below land surface	DCE	dichloroethene	FS	field split; feasibility study
BOD	biological oxygen demand	DDD	dichlorodiphenyldichloroethane	ft	feet
BRAC	Base Realignment and Closure	DDE	dichlorodiphenyldichloroethene	ft/ft	feet per foot
Braun	Braun Interfec Corporation	DDT	dichlorodiphenyltrichloroethane	FTA	Fire Training Area
BTAG	Biological Technical Assistance Group	DEH	Direcstate of Engineering and Housing	FTMC	Fort McChellan
BTEX	benzene, toluene, ethyl benzene, and xylenes	DJP	depositional soil	F	gram
BTOC	below top of casing	DI	deionized	G-856	Geometrics, Inc. G-856 magnetometer
BW	biological warfare	DIMP	di-isopropylnitelylphosphonate	G-858G	Geometrics, Inc. G-858G magnetic gradiometer
BZ	breathing zone; 3-quintacidlyl benzilate	DIMP	dimethylmethylphosphonate	gal	gallon
C	ceiling limit value	DOD	U.S. Department of Defense	gal/min	gallons per minute
Ca	carcinogen	DOT	Department of Transportation	gc	scan
CCAL	continuing calibration	DP	direct-push	GCC	gas chromatograph
CCB	continuing calibration blank	DPDO	Defense Property Disposal Office	GC/MS	gas chromatograph/mass spectrometer
CD	compact disc	DPT	direct-push technology	GFAA	graphite furnace atomic absorption
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act	DOO	data quality objective	GIS	Geographic Information System
		DRMO	Defense Realization and Marketing Office		

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## List of Abbreviations and Acronyms (Continued)

gm	silty gravels; gravel-sand-silt mixtures	L	lewisite; liter	NIOSH	National Institute for Occupational Safety and Health
gp	poorly graded gravels; gravel-sand mixtures	LC <sub>50</sub>	lethal concentration for 50 percent of population tested	No.	number
gpm	gallons per minute	LD <sub>50</sub>	lethal dose for 50 percent of population tested	NOAA	National Oceanic and Atmospheric Administration
GPR	ground-penetrating radar	l	liter	NOAEL	no-observed-adverse-effects-level
GPS	global positioning system	LCS	laboratory control sample	NR	not requested; not recorded
GS	ground scar	LEL	lower explosive limit	ns	nanosecond
GSA	General Services Administration	LOAEL	lowest-observed-adverse-effects-level	N-S	north to south
GSBP	Ground Scar Boiler Plant	LT	less than the certified reporting limit	NS	not surveyed
GSSI	Geophysical Survey Systems, Inc.	max	maximum	nT	nanotesla
GST	ground stain	MCL	maximum contaminant level	NTU	nephelometric turbidity unit
GW	groundwater	MDL	method detection limit	O&G	oil and grease
gw	well-graded gravels; gravel-sand mixtures	mg/kg	milligrams per kilogram	OD	outside diameter
HA	hand auger	mg/L	milligrams per liter	OE	ordnance and explosives
HCl	hydrochloric acid	mg/m <sup>3</sup>	milligrams per cubic meter	oh	organic clays of medium to high plasticity
HD	distilled mustard	mh	inorganic silts, micaceous or diatomaceous fine, sandy or silt soils	ol	organic silts and organic silty clays of low plasticity
HDPE	high-density polyethylene	MHz	megahertz	OP	organophosphorus
Herb.	herbicides	µg/g	micrograms per gram	ORP	oxidation-reduction potential
HNO <sub>3</sub>	nitric acid	µg/kg	micrograms per kilogram	OSHA	Occupational Safety and Health Administration
hr	hour	µg/L	micrograms per liter	OWS	oil/water separator
H&S	health and safety	µmhos/cm	micromhos per centimeter	oz	ounce
HSA	hollow-stem auger	min	minimum	PAH	polynuclear aromatic hydrocarbon
HTRW	hazardous, toxic, and radioactive waste	MINICAMS	miniature continuous air sampling system	Parsons	Parsons Engineering Science, Inc.
'I'	out of control, data rejected due to low recovery	ml	inorganic silts and very fine sands	Pb	lead
ICAL	initial calibration	mL	milliliter	PCB	polychlorinated biphenyl
ICB	initial calibration blank	mm	millimeter	PCE	perchloroethene
ICP	inductively-coupled plasma	MM	mounded material	PCP	pentachlorophenol
ICS	interference check sample	MOGAS	motor vehicle gasoline	PDS	Personnel Decontamination Station
ID	inside diameter	MPA	methyl phosphonic acid	PEL	permissible exposure limit
IDL	instrument detection limit	MR	molasses residue	Pest.	pesticide
IDLH	immediately dangerous to life or health	MS	matrix spike	PG	professional geologist
IDM	investigative derived media	mS/cm	millisiemens per centimeter	PID	photoionization detector
IDW	investigation-derived waste	MSD	matrix spike duplicate	PkA	Philo and Stendal soils local alluvium, 0 to 2 percent slopes
IMPA	isopropylmethyl phosphonic acid	MTBE	methyl tertiary butyl ether	POL	petroleum, oils, and lubricants
IMR	Iron Mountain Road	msl	mean sea level	PP	peristaltic pump
in.	inch	MtD3	Montevillo shaly, silty clay loam, 10 to 40 percent slopes, severely eroded	ppb	parts per billion
Ing	ingestion	mV	millivolts	PPE	personal protective equipment
Inh	inhalation	MW	monitoring well	ppm	parts per million
IP	ionization potential	N/A	not applicable, not available	PPMP	Print Plant Motor Pool
IPS	International Pipe Standard	NAD	North American Datum	ppt	parts per thousand
IRDMIS	Installation Restoration Data Management Information System	NAD83	North American Datum of 1983	PRG	preliminary remediation goals
ISCP	Installation Spill Contingency Plan	NAVD88	North American Vertical Datum of 1988	PSSC	potential site-specific chemical
IT	IT Corporation	NCP	National Contingency Plan	pt	peat or other highly organic silts
ITEMS	IT Environmental Management System™	ND	not detected	PVC	polyvinyl chloride
'J'	estimated concentration	NE	no evidence; northeast	QA	quality assurance
JcB2	Jefferson gravelly fine sandy loam, 2 to 6 percent slopes, eroded	NFA	No Further Action	QA/QC	quality assurance/quality control
JcC2	Jefferson gravelly fine sandy loam, 6 to 10 percent slopes, eroded	ng/L	nanograms per liter	QAP	installation-wide quality assurance plan
JIB	Jefferson stony fine sandy loam, 0 to 10 percent slopes have strong slopes	NGVD	National Geodetic Vertical Datum	QC	quality control
K	conductivity	NIC	notice of intended change	QST	QST Environmental Inc.

List of Abbreviations and Acronyms (Continued)

q/y	quantity	SI	standard unit	WP	installation-wide work plan
Qual	qualifier	SVOC	semivolatile organic compound	WS	watershed
'R'	rejected; re-sample	SW	surface water	WSA	Watershed Screening Assessment
RAO	removal action objective	SW-846	U.S. EPA Test Methods for Evaluating Solid Waste: Physical/Chemical Methods	WWI	World War I
RMC	EPA Region III Risk Based Concentration			WWII	World War II
RCRA	Resource Conservation and Recovery Act			XRF	x-ray fluorescence
RDX	cyclonite	SZ	support zone	yd <sup>3</sup>	cubic yards
ReB3	Rarden silty clay loams	TAL	target analyte list		
REG	field sample	TAT	turn around time		
REL	recommended exposure limit	TB	trip blank		
RI/A	request for analysis	TCA	trichloroethane		
RI	remedial investigation	TCDD	2,3,7,8-tetrachlorodibenzo-p-dioxin		
RL	reporting limit	TCDF	tetrachlorodibenzofurans		
RPD	relative percent difference	TCE	trichloroethene		
RPF	relative response factor	TCL	target compound list		
RSD	relative standard deviation	TCLP	toxicity characteristic leaching procedure		
RTK	real-time kinematic	TDGCL	thiodiglycol		
SAD	South Atlantic Division	TDGCLA	thiodiglycol chloroacetic acid		
SAC	Society of Automotive Engineers	TERC	Total Environmental Restoration Contract		
SAP	Science Applications International Corporation	TIC	tentatively identified compound		
sc	installation-wide sampling and analysis plan	TLV	threshold limit value		
Sch.	clayey sands; sand-clay mixtures	TN	Tennessee		
SD	schedule	TOC	top of casing; total organic carbon		
SD	sediment	TPH	total petroleum hydrocarbons		
SDG	sample delivery group	TRADOC	U.S. Army Training and Doctrine Command		
SDZ	safe distance zone; surface danger zone	TRPH	total recoverable petroleum hydrocarbons		
SEMS	Southern Environmental Management & Specialties, Inc.	TWA	time weighted average		
SFS/SP	site-specific field sampling plan	UCL	upper confidence limit		
SCF	standard grade fuels	UCLR	upper certified range		
SIHP	installation-wide safety and health plan	'U'	not detected above reporting limit		
SI	site investigation	USACE	U.S. Army Corps of Engineers		
SL	standing liquid	USACIEPM	U.S. Army Center for Health Promotion and Preventive Medicine		
SL	silly sands; sand-silt mixtures	USAEC	U.S. Army Environmental Center		
SM	Serratia marcescens	USAEIA	U.S. Army Environmental Hygiene Agency		
SOP	standard operating procedure	USACMIS	U.S. Army Chemical School		
SP	poorly graded sands; gravely sands	USAMPS	U.S. Army Military Police School		
SP	sump pump	USATEU	U.S. Army Technical Escort Unit		
Sc-90	strontium-90	USATTIAMA	U.S. Army Toxic and Hazardous Material Agency		
Ss	stony rough land; sandstone series	USCS	Unified Soil Classification System		
SS	surface soil	USDA	U.S. Department of Agriculture		
SSC	site-specific chemical	USEPA	U.S. Environmental Protection Agency		
SSH0	site safety and health officer	UST	underground storage tank		
SSIHP	site-specific safety and health plan	UXO	unexploded ordnance		
SSSL	site-specific screening level	VOA	volatile organic analyte		
STB	supernatant bleach	VOC	volatile organic compound		
STL	short-term exposure limit	VOH	volatile organic hydrocarbon		
STOLS	Surface Towed Ordnance Locator System*	VQJlf	validation qualifier		
Std. units	standard units	VQual	validation qualifier		
		VX	nerve agent (O-ethyl S-[diisopropylaminoethyl]-methylphosphonothioate)		
		Weston	Roy F. Weston, Inc.		

SAIC – Data Qualifiers, Codes and Footnotes, 1995 Remedial Investigation

N/A – Not analyzed	
ND – Not detected	
Boolean Codes	
LT – Less than the certified reporting limit	
Flagging Codes	
9 – Non-demonstrated/validated method performed for USAEC	
B – Analyte found in the method blank or QC blank	
C – Analysis was confirmed	
D – Duplicate analysis	
I – Interfaces in sample; make quantitation and/or identification to be suspicious	
J – Value is estimated	
K – Reported results are affected by interfaces or high background	
N – Tentatively identified compound (match greater than 70%)	
Q – Sample interference obscured peak of interest	
R – Non-target compound analyzed for but not detected (GC/MS methods)	
S – Non-target compound analyzed for and detected (GC/MS methods)	
T – Non-target compound analyzed for but not detected (non GC/MS methods)	
U – Analysis in unconfirmed	
Z – Non-target compound analyzed for and detected (non-GC/MS methods)	
Qualifiers	
J – The low-spike recovery is low	
N – The high-spike recovery is low	
R – Data is rejected	



**Final  
Site-Specific Unexploded Ordnance Safety Plan Attachment  
Site Investigation for the Groundwater Investigation at the  
Burial Mound at Rideout Field-Pelham Range, Parcel 202Q,  
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**

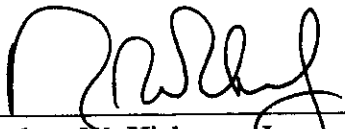
**Task Order CK10  
Contract No. DACA21-96-D-0018  
IT Project No. 796887**

**June 2001**

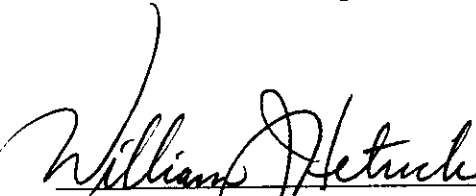
**Revision 0**

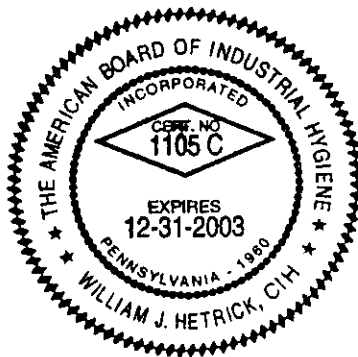
**Final**  
**Site-Specific Unexploded Ordnance Safety Plan Attachment**  
**Site Investigation at the Burial Mound at Rideout Field-Pelham**  
**Range, Parcel 202Q,**  
**Fort McClellan, Calhoun County, Alabama**

I have read and approve this site-specific unexploded ordnance (UXO) safety plan attachment at the Burial Mound at Rideout Field-Pelham Range, Parcel 202Q, at Fort McClellan, Alabama, with respect to project hazards, regulatory requirements, and IT Corporation UXO procedures.

  
Robert W. Hickman, Jr.  
UXO Technical Manager

8-8-01  
Date

  
William J. Hetrick, CIH  
Health & Safety Manager



6/14/01  
Date

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Attachment 1 – Fort McClellan Unexploded Ordnance Supplementary Procedures	

## **1.0 Introduction**

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This document defines anomaly avoidance procedures for activities to be performed by IT Corporation (IT) unexploded ordnance (UXO) personnel in conjunction with the site investigation at the Burial Mound at Rideout Field-Pelham Range, Parcel 202Q, at Fort McClellan (FTMC), Calhoun County, Alabama. This document is not a stand-alone document; it must be used in conjunction with the *Fort McClellan Unexploded Ordnance Supplementary Procedures* (IT, 2001), attached as Attachment 1.

IT UXO personnel will perform visual surveys, assisted by hand-held magnetometers and metal detectors, to support the collection of samples at the Burial Mound at Rideout Field-Pelham Range, Parcel 202Q. The purpose is to avoid any ordnance or explosives (OE) during hazardous, toxic, and radioactive waste (HTRW) sampling activities. Intrusive anomaly investigation is not authorized for this site work.

The Burial Mound at Rideout Field is located in the western part of Pelham Range in Training Area 24C. Rideout Field was used as part of the Chemical School's Radiological Survey Training Facility from 1965-1972 and as a burial site for radioactive materials. There is a possibility that unexploded ordnance is present at this site. Items disposed at the site included radioactive sources and soils contaminated with radioactive materials buried in cut-down 55-gallon drums.

## **2.0 UXO Team Composition**

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UXO team and personnel requirements will be in accordance with EP 75-1-2 (U.S. Army Corps of Engineers [USACE], 2000) and the installation-wide sampling and analysis plan (SAP) (IT, 2000) for FTMC. A UXO team will be on site during all sampling or intrusive activities where OE is suspected.

UXO avoidance activities at the Burial Mound at Rideout Field-Pelham Range, Parcel 202Q include:

a) Access Corridors and Sampling Sites

- (1) The UXO team will conduct access surveys of the footpaths and vehicular lanes approaching and leaving each of the investigation sites. Access surveys will begin in a known clear area and proceed by the most direct route to the sampling site. The boundaries of the access route and sampling site will be marked with white tape or white pin flags.
- (2) If an OE item is found during the survey, the location will be conspicuously marked with a red pin flag and avoided by altering the route. Additionally, UXO personnel will complete the IT FTMC "Unexploded Ordnance Report Form." Subsurface anomalies will be marked with a yellow flag.
- (3) The boundaries of the access route and sampling site will be recorded in the IT FTMC "UXO Sketch Log" by the UXO technician. Additionally, anomaly locations will be recorded on this form.
- (4) Instrumentation used at this site will include the Schonstedt GA 72, the CST Corporation Magna-Trak 102, or Whites Spectrum XLT Metal Detector. Additionally, the Schonstedt MG-220 or MG-230 will be set up for downhole monitoring. All equipment will be operated as specified in the appropriate operator's manual. All equipment will be function tested prior to use following the procedure in paragraph 3.2, "FTMC UXO Supplementary Procedures" (IT, 2001) and the operator's instructions. The Whites Metal Detector will be used in conjunction with hand-held magnetometers in areas of high concentrations of rocks with a magnetic signature to assist in eliminating anomalies created by "hot rocks."
- (5) The access route will be twice as wide as the widest vehicle that will use the route. Footpath lanes will be a minimum of three feet wide.
- (6) If surface OE or subsurface anomalies are encountered that cannot be avoided, the access route must be diverted to avoid contact. No personnel will be allowed outside of the surveyed areas without a UXO escort. No unescorted access is permitted inside the corridor area until a survey has been completed and boundaries established.
- (7) At the actual investigation site, the UXO team must also complete a survey of an area sufficient to support mechanical excavation equipment maneuverability, parking of support vehicles, and establishment of

b) Vegetation Removal

In cases where large trees or other vegetation removal is required to support access or sampling operations, the procedures in paragraph 4.2, "FTMC UXO Supplementary Procedures," will be followed (IT, 2001).

c) Magnetometer/Metal Detector Checkout and Field Procedures

The procedures in paragraph 3.0, "FTMC UXO Supplementary Procedures" will be followed (IT, 2001).

d) UXO Logbooks and Documentation

All UXO personnel identified in paragraph 5.0, "FTMC UXO Supplementary Procedures," (IT, 2001) will maintain a logbook in accordance with that procedure.

## **6.0 Safety**

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In addition to the requirements of the site-specific safety and health plan prepared for this site, the UXO personnel will ensure the following:

- a) During the access and subsurface surveys conducted with a geophysical instrument, the UXO team members will not wear safety shoes or other footwear that would cause the instrument to present a false response.
- b) The UXO team will not be required to wear protective helmets unless an overhead hazard is present.
- c) The FTMC UXO Safety Officer will monitor UXO activities to ensure compliance with applicable safety requirements.
- d) The FTMC UXO Safety Officer will certify that all FTMC UXO workers are capable of performing UXO activities at FTMC based on observation of work performance.
- e) The FTMC UXO Safety Officer is responsible for all site-specific UXO training.
- f) The UXO technician on site will advise project personnel regarding all evacuation and/or exclusion zones as appropriate. The UXO technician will

## **ATTACHMENT 1**

# **FORT MCCLELLAN UNEXPLODED ORDNANCE SUPPLEMENTARY PROCEDURES**

---

## **FTMC UXO SUPPLEMENTARY PROCEDURES**

**Subject: Ordnance and Explosives**

---

### **1.0 INTRODUCTION**

IT Corporation (IT) has been retained by the U.S. Army Corps of Engineers-Mobile District, under Contract Number DACA21-96-D-0018, to provide environmental services related to Base realignment and closure (BRAC) of Fort McClellan, Alabama. The Installation-Wide Ordnance and Explosives (OE) Management Plan for Fort McClellan (FTMC) was prepared by IT Corporation and submitted as a final document in March 2000. The Installation-Wide OE Management Plan was prepared to provide general guidance for conducting unexploded ordnance (UXO) work associated with hazardous, toxic, and radiological waste (HTRW) investigations and remedial activities currently in progress at FTMC. IT Corporation prepares site-specific field sampling, health and safety, and UXO safety plans for sites where fieldwork will occur that may potentially contain OE. A UXO Safety Plan is not prepared for sites that are not reported to be in areas containing OE.

#### **1.1 Purpose**

This document is intended to provide procedures to the field staff that outline UXO operations and clarify activities currently permitted under "anomaly avoidance." The document is not intended to replace any of the project documents currently approved; rather, it is intended to complement those documents with additional information that allows successful completion of the job.

### **2.0 FTMC EMPLOYEE ORIENTATION/TRAINING AND CERTIFICATION**

The IT FTMC orientation program is designed to:

- Indoctrinate new employees to FTMC-unique procedures
- Verify compliance with regulatory certification requirements
- Provide continuing instruction and updating in UXO fundamentals to sustain readiness to safely perform UXO tasks



then certify that the individual is capable of performing UXO activities at FTMC based upon satisfactory performance of the three-day period. A copy of this certification will be maintained in the individual's site FTMC training file (see example at Attachment 1).

### **2.3 UXO Sustainment Training**

All UXO technicians have had the OSHA 40-hour hazardous waste operations and emergency response (HAZWOPER) course in order to be initially certified at FTMC. They are also required to maintain the certification with an 8-hour OSHA refresher course on an annual basis. Additionally, all IT FTMC UXO personnel will have 8 hours of site-specific annual UXO sustainment training. This training can be performed incrementally (2 hours every quarter) at the discretion of the site superintendent in coordination with the FTMC IT UXO Safety Officer. Topics will include, but are not limited to, the following subjects:

- Site-specific environmental hazards
- Site-specific UXO hazards, ordnance fuzing, functioning and precautions
- Topics which the IT UXO Team Leader or IT Safety UXO Officer determines necessary to support FTMC UXO activities

Sustainment training will be conducted for a period of no less than 8 hours. Daily safety briefings, tailgate safety meetings, and other required site-specific training are not a substitute for this training. The purpose of this training is to provide each UXO employee with site-specific UXO training over and above OSHA requirements. The site-specific UXO training will be recorded in the project file and the UXO employee's personnel file.

### **3.0 FTMC MAGNETOMETER/METAL DETECTOR FUNCTION TEST AND FIELD PROCEDURES**

This section provides FTMC magnetometer/metal detector function tests and operating procedures to be employed at all work sites that have been identified as requiring avoidance support.

MG-230 will be set up for downhole monitoring. All equipment will be operated in a manner consistent with instructions contained in the appropriate operator's manual. All equipment will be function-tested prior to use. The White's Metal Detector will be used in conjunction with hand-held magnetometers in areas of high concentrations of rocks with a magnetic signature, to assist in eliminating anomalies created by "hot rocks." The operating manual for each of the instruments used at FTMC will be available for use with the equipment.

- Once the instrument has been determined to be working according to the manufacturer's operating manual, the operator will perform a function test on the FTMC geophysical test plot using the detection methods described in the manual. A function test will consist of using the instrument over a minimum of three test sources. The same sources will be used during each function test to ensure consistency. The instrument detection indicator, as described in the operator's manual, will be noted in the instrument logbook. For site checks, a 6-inch length of 1/2-inch steel reinforcing rod will be available to each operator at the work site.
- Instruments that fail to reproduce a detection indication consistent with previous tests will be checked to ensure that the power supply or batteries are sufficient. If the power supply is determined to be sufficient and the operator cannot find a fault in accordance with the operator's manual, the instrument will be tagged and removed from service.
- Function tests will be performed each morning before the equipment is put into service.
- If an instrument is determined to be working improperly, the FTMC UXO Team Leader and the site superintendent will be immediately notified. Any activities performed using that instrument since its last positive test procedure will be considered invalid and will require reevaluation.
- Upon completion of the function test, the "Magnetometer/Metal Detector Functions Test Data Sheet" (Attachment 2) and the equipment logbook will be filled out.

is installed, the location of bollards will be adjusted as required if an anomaly is detected during the bollard installation process.

The White's Metal Detector will be used to augment the magnetometers on sites where "hot rocks" are suspected. The purpose of using the metal detector in addition to the magnetometers is to eliminate the probability of "hot rocks."

#### **4.0 FTMC ACCESS CLEARANCES, VEGETATION REMOVAL, AND ROAD MAINTENANCE**

This section is designed to provide specific procedures regarding activities associated with the building of access corridors, vegetation removal, and road maintenance in support of FTMC operations.

##### **4.1 Access Corridors**

The purpose of access corridors is to enable IT personnel access to well and/or other types of sampling sites within FTMC. Access corridors will be created by marking the route, both length and width, in which a UXO survey has been performed. The marking method will be defined in each site-specific UXO safety plan. No unescorted access is permitted until a corridor has been established. If an anomaly is detected during the survey or during a subsequent excavation, it must be avoided, since investigation is not authorized. The route will be altered to avoid the anomaly for FTMC activities. A magnetometer is considered to reliably detect anomalies to a depth of one foot.

The size of each area to be surveyed is dependent on the type and quantity of equipment expected to be used on that site. The UXO survey crew will follow the procedures outlined in the site-specific UXO safety plan to determine the dimensions of the area to be surveyed. Normally, the width of the access route will be at least twice as wide as the widest vehicle that will use the route; footpaths will be a minimum of 3 feet wide.

Tracked or other vehicles, that disturb the soil are authorized for use only in areas that have been surveyed and no anomalies have been detected.

Erosion and weathering will typically cause some UXO items to leach to the surface or otherwise be uncovered. In cases where access corridors or sampling sites have not been surveyed or traversed for a period of time, additional UXO surveys may be required. The decision regarding the performance of additional

equipment will be moved, the location of the object marked and recorded on the IT FTMC Unexploded Ordnance Report Form (Attachment 3), and the route changed to avoid the object. If no suspicious objects are detected, the equipment will continue to move earth at a rate of no more than one foot of depth at a time. If, more grading is required after the first pass is complete the UXO technician will perform another survey. If no anomalies are detected, the equipment can repeat the grading process. If an anomaly is detected, the operation will be halted and the route changed.

- After an area has been surveyed and no anomalies have been detected, soil can be removed at a rate of no more than one foot per lift. If additional grading is required, a survey will be performed after each one-foot increment the soil has been removed.
- Earth may not, at any time, be moved at a rate of more than one foot in each lift.

## **5.0 FTMC UXO LOG BOOKS**

All UXO team leaders or UXO technicians supporting HTRW operations will maintain a logbook. The purpose of the logbook is to record UXO actions and activities taken at each work site.

### **5.1 Responsibilities**

UXO personnel will maintain an individual daily logbook of work activities.

The logbooks will be routinely inspected weekly by the UXO QC Officer and will be made available to the FTMC site superintendent upon request. Copies will be made daily and filed in the IT Field Project office.

Logbooks will contain bound and numbered pages. Entries will be on successive pages as work is performed. The individual using the logbook will sign the page after the last entry for that page has been made. Logbooks are part of the project legal file and will be filed with the project files upon completion of each investigation.

## ATTACHMENT 1

### FTMC Employee Certification (Example)

I certify that (name of individual) has fulfilled all UXO orientation requirements and has been observed by me for a period of 3 work days and is therefore eligible to perform UXO activities at FTMC.

---

Jim Kerr  
FTMC UXO Safety Officer

## ATTACHMENT 3

### Unexploded Ordnance Report Form

Report Tracking Number:															
<b>Discovery and Reporting Time</b>															
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="2">Time of Discovery</th> </tr> <tr> <th style="width: 50%;">Date</th> <th style="width: 50%;">Time</th> </tr> <tr> <td style="height: 20px;"></td> <td></td> </tr> </table>		Time of Discovery		Date	Time			<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="2">Time Reported to Base Transition Force</th> </tr> <tr> <th style="width: 50%;">Date</th> <th style="width: 50%;">Time</th> </tr> <tr> <td style="height: 20px;"></td> <td></td> </tr> </table>		Time Reported to Base Transition Force		Date	Time		
Time of Discovery															
Date	Time														
Time Reported to Base Transition Force															
Date	Time														
Employee Name: _____		Reported to FTMC Transitional Force Personnel Name: _____													
<b>Location of Ordnance</b>															
Location, Description, and Parcel Number:															
Coordinates of Ordnance:		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="2">State Plane Coordinates</th> </tr> <tr> <th style="width: 50%;">Northing</th> <th style="width: 50%;">Easting</th> </tr> <tr> <td style="height: 20px;"></td> <td></td> </tr> </table>		State Plane Coordinates		Northing	Easting								
State Plane Coordinates															
Northing	Easting														
<div style="text-align: right; margin-right: 50px;"> <table border="1" style="width: 80%; border-collapse: collapse;"> <tr> <th colspan="4">Picture Taken of Ordnance</th> </tr> <tr> <th style="width: 25%;">Yes</th> <th style="width: 25%;">No</th> <th style="width: 25%;">Date</th> <th style="width: 25%;">Time</th> </tr> <tr> <td style="height: 20px;"></td> <td></td> <td></td> <td></td> </tr> </table> </div>				Picture Taken of Ordnance				Yes	No	Date	Time				
Picture Taken of Ordnance															
Yes	No	Date	Time												
Written Description and/or Sketch of Ordnance:															
<b>Corrective Action Taken by Fort McClellan Transition Force</b>															
Date															

These standard policies and procedures are applicable to all members of The IT Group, Inc. except where superceded or modified by the member Company.

## ATTACHMENT 5

### UXO Sketch Location Log

District: \_\_\_\_\_ Hole Number: \_\_\_\_\_ Date: \_\_\_\_\_

Company Name: IT Corporation Subcontractor: \_\_\_\_\_

Parcel Location: \_\_\_\_\_ Well Location: \_\_\_\_\_ Date Started: \_\_\_\_\_ Date Completed: \_\_\_\_\_

Type of UXO Work Being Performed:


Most Probable Munition: \_\_\_\_\_

Down-Hole Depth Achieved for UXO Avoidance: \_\_\_\_\_

Total Number of Surface UXO Marked: \_\_\_\_\_

Total Number of Anomalies Marked: \_\_\_\_\_

Location Sketch/Comments:

Not to Scale

<p>Signature of UXO Technician: _____</p>	<p>Date: _____</p>
---	--------------------

These standard policies and procedures are applicable to all members of The IT Group, Inc. except where superceded or modified by the member Company.

**Final  
Site-Specific Safety and Health Plan Attachment  
for the  
Groundwater Investigation at the Burial Mound  
at Rideout Field-Pelham Range  
Fort McClellan  
Calhoun County, Alabama  
EPA ID No. AL7 210 020 562**

**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**

**Delivery Order CK10  
Contract No. DACA21-96-D-0018  
IT Project No. 796887**

**June 2001**

**Revision 1**

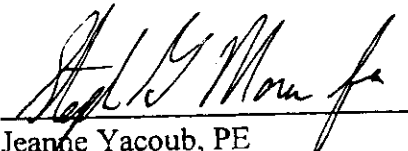
The following Safety and Health Plan (SHP) has been designed for the methods presently contemplated by IT Corporation (IT) for execution of the proposed work. Therefore, the SHP may not be appropriate if the work is not performed by or using the methods presently contemplated by IT.

In addition, as the work is performed, conditions different from those anticipated may be encountered and the SHP may have to be modified. Therefore, IT only makes representations or warranties as to the adequacy of the SHP for currently anticipated activities and conditions.

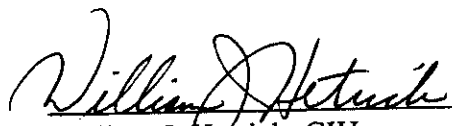


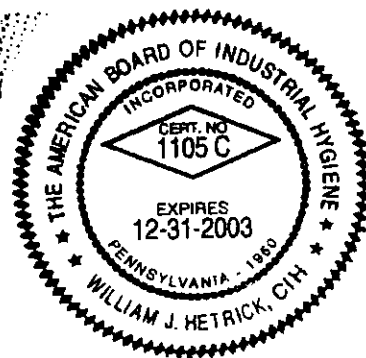
## Site-Specific Safety and Health Plan Attachment Approval Fort McClellan, Calhoun County, Alabama

I have read and approve this site-specific safety and health plan for the groundwater investigation of the Burial Mound located on Rideout Field-Pelham Range, at Fort McClellan, Alabama, with respect to project hazards, regulatory requirements, and IT Corporation procedures.


  
Jeanne Yacoub, PE  
Project Manager

Date 6/19/01

  
William J. Hetrick, CIH  
Health & Safety Manager



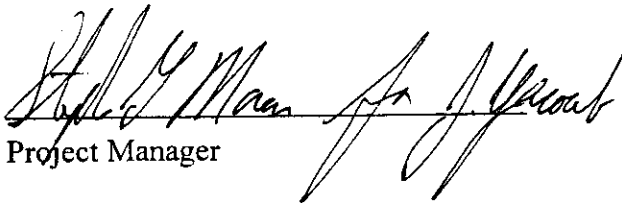
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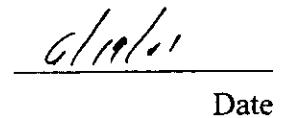
  
Jeff Farr  
Site Coordinator

Date 6/19/01

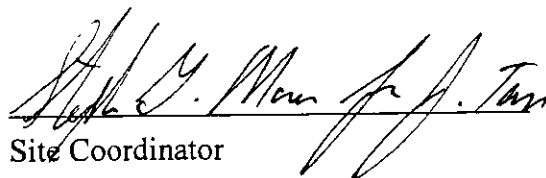
## Acknowledgments

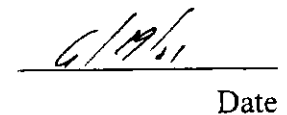
The final approved version of this site-specific safety and health plan (SSHP) attachment for the groundwater investigation of the Burial Mound located on Rideout Field (Parcel 202Q-RD)- Pelham Range, Fort McClellan, Alabama, has been provided to the site coordinator. I acknowledge my responsibility to provide the site coordinator with the equipment, materials, and qualified personnel to implement fully all safety requirements in this SSHP attachment. I will formally review this plan with the health and safety staff every six months until project completion.

  
Project Manager

  
Date

I acknowledge receipt of this SSHP attachment from the project manager, and that it is my responsibility to explain its contents to all site personnel and cause these requirements to be fully implemented. Any change in conditions, scope of work, or other change that might affect worker safety requires me to notify the project manager and the health and safety manager.

  
Site Coordinator

  
Date

## Site-Specific Safety and Health Plan Acknowledgement Form

I have been informed of, and will abide by the procedures set forth in, this site-specific safety and health plan attachment for the groundwater investigation of the Burial Mound located on Rideout Field (Parcel 202Q-RD)-Pelham Range, at Fort McClellan, Calhoun County, Alabama.

**Printed Name**

**Signature**

## Representing

**Date**This image shows a single sheet of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page. There are approximately 20 lines visible. The paper has a slightly textured appearance and is set against a dark background.

## **Fort McClellan Gate Hours**

Baltzell Gate	Baltzell Road. Open 24 hours daily, 7 days a week.
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## **Pelham Range Access Requirements**

Pelham Range	IT personnel will contact the Range Control Office each day access is required to receive an access permit and available areas of entry. See Attachment 1 for Range Control Contact for Pelham Range.
--------------	---

## Fort McClellan Project Emergency Contacts

Range Control Office (Main Post).....	(256) 848-6772
Fire Department (on post).....	911
Fire Department (off post) .....	(256) 237-3541
Ambulance (off post) .....	911
Regional Medical Center .....	(256) 235-5121
Military Police (SSG Busch) .....	(256) 848-5680, 848-4824
DOD Guard Force (Mr. Bolton) .....	(256) 848-5680, 848-4732
Anniston Police Department.....	(256) 238-1800
Chemical Agent Emergencies.....	(256) 895-1598
(Jimmy Walker, CEHNC).....	cell phone (256) 759-3931
UXO Emergencies .....	(256) 895-1598
(Jimmy Walker, CEHNC).....	cell phone (256) 759-3931
UXO Nonemergencies/Reporting Only (Ronald Levy) .....	(256) 848-3758
Baltzell Gate Guard Shack.....	(256) 848-5693, 848-3821
National Response Center & Terrorist Hotline.....	(800) 424-8802
Poison Control Center.....	(800) 462-0800
EPA Region IV .....	(404) 562-8725
Ronald Levy, Chief, FTMC Environmental Management .....	(256) 848-3758
Ellis Pope, U.S. Army Corps of Engineers.....	(334) 690-3077
Jeanne Yacoub, IT Project Manager .....	(770) 663-1429
Bill Hetrick, IT H&S Manager .....	(865) 690-3211, pager (888) 655-9529
Mike Moore, Fort McClellan Safety Officer .....	(256) 848-5433
Sargeant Tim Lane, National Guard Security Operations .....	(256) 848-6176
Dr. Jerry Burke, IT Occupational Physician.....	(800) 350-4511

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Attachment 1 – Pelham Range Emergency Route and Range Control Contact

## ***List of Acronyms***

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See Attachment 1, List of Abbreviations and Acronyms, Site-Specific UXO Safety Plan contained in this binder.

## **1.0 Site Work Plan Summary**

---

**Project Objective.** The objective of this investigation at Fort McClellan (FTMC), Calhoun County, Alabama, is to install four groundwater monitoring wells at the Burial Mound at Rideout Field (Parcel 202Q-RD)-Pelham Range. One well will be upgradient, and three wells will be downgradient of the Burial Mound. At the completion of well installation, four groundwater samples will be collected and analyzed for gamma-emitting radionuclides.

### **Project Tasks**

- Conduct a surface and near-surface unexploded ordnance (UXO) survey over all areas to be included in the sampling effort.
- Provide downhole UXO support for all intrusive drilling activity to determine the presence of potential downhole hazards.
- Install groundwater monitoring wells.
- Collect groundwater samples.

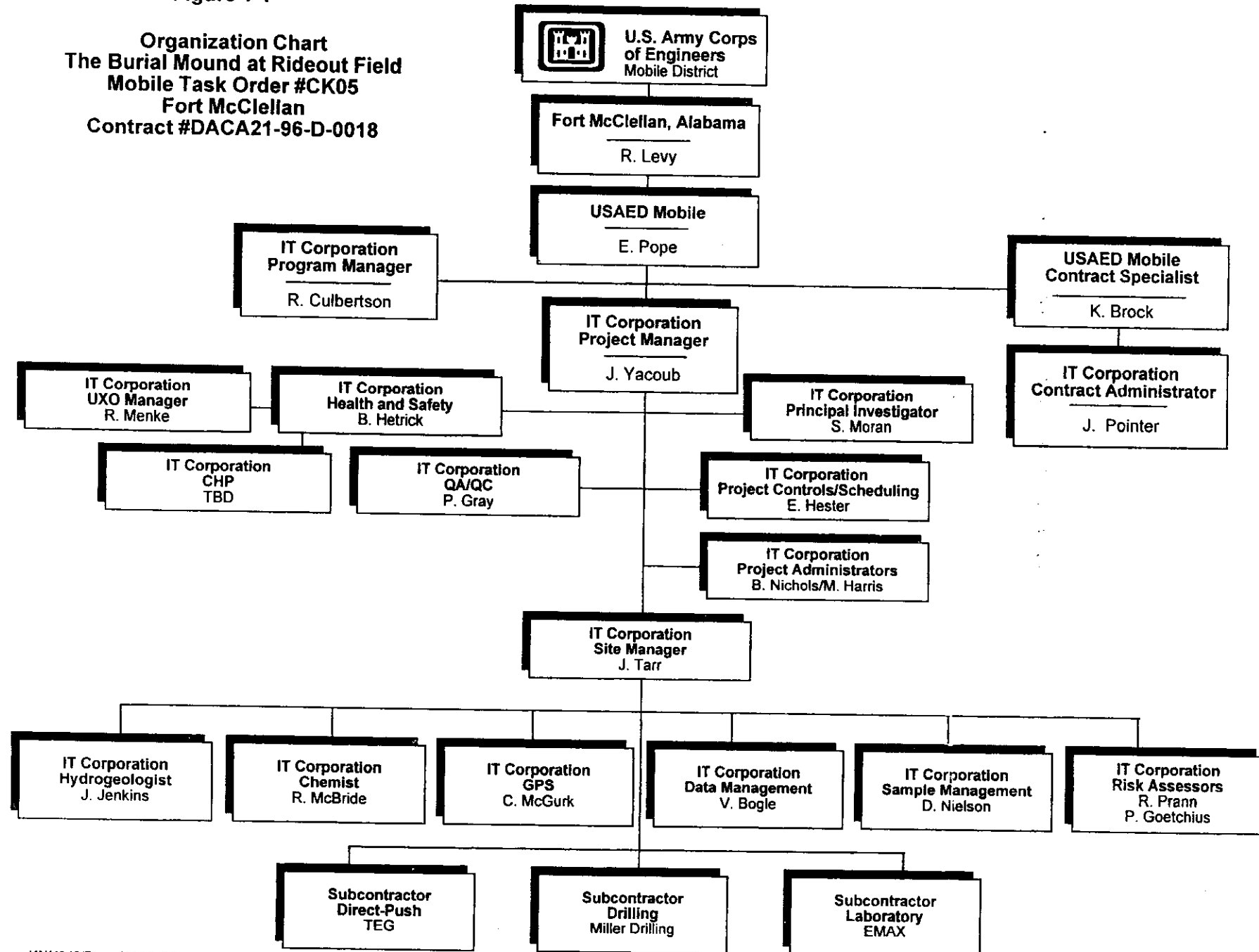
**Personnel Requirements.** Up to 15 employees. See Figure 1-1 for an organization chart.

Note: All personnel on this site shall have received training, informational programs, and medical surveillance as outlined in the installation-wide safety and health plan (SHP) for site investigations at FTMC and be familiar with the requirements of this site-specific SHP (SSHP). This SSHP must be used in conjunction with the SHP, FTMC, Alabama, and the site-specific unexploded ordnance plan attachment for the Burial Mound at Rideout Field-Pelham Range.



Figure 1-1

**Organization Chart  
The Burial Mound at Rideout Field  
Mobile Task Order #CK05  
Fort McClellan  
Contract #DACA21-96-D-0018**



## **2.0 Site Characterization and Analysis**

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### **2.1 Anticipated Hazards**

The activity hazard analysis in Chapter 5.0 contains project-specific practices utilized to reduce or eliminate anticipated site hazards. The activity hazard analysis indicates specific chemical and physical hazards that may be present and encountered during each task from on-site operations. Below each task is a list of hazards and specific actions that will be taken to control the respective hazards. These control measures may include work practice controls, engineering controls, and/or use of appropriate personal protective equipment (PPE). Site control with the use of specific work zones (support zone, contamination reduction zone, and exclusion zone) is addressed in Chapter 7.0 of Appendix A of the IT Corporation (IT) March 2000 *Final Installation-Wide Sampling and Analysis Plan, Fort McClellan, Calhoun County, Alabama*.

#### **2.1.1 Radiological Hazards**

Rideout Field was used, in part, as a radioactive material burial site for radioactive sources used in training exercises from 1965 to 1972. After 1972, the burial site was cleared, and the excavation of the site created what is known as the Burial Mound. Disposal at the Burial Mound site included mostly radioactive laboratory wastes buried at a depth of 6 to 8 feet. The radioisotopes expected to be present in the waste are Cesium-137, Cobalt-60 (Co-60), and Strontium-90, both gamma- and beta-emitting radioisotopes. Table 2-1 lists the radioisotopes and their respective decay energies. It is also reported that leaking Co-60 sources were routinely buried in cut-down 55-gallon drums with soil contaminated from leaking Co-60 sources.

Beta particles are the equivalent of an electron, except they originate in the nucleus of the atom. Energy of beta particles varies widely, with initial beta maximum energies ranging from 2.3 mega electron volts to tens of thousands of electron volts. On an atomic scale, beta particles are small, so they can travel in air and matter. A rule of thumb for beta particles is that a 1-mega-electron-volt beta will travel about 11 feet in air.

Beta particles are considered an external and internal radiation hazard. The energy of the beta particles can be deposited externally in the skin, or internally if the radioactive material gets inside the body. When large amounts of beta particles interact with the skin, they can cause reddening of the skin, much like a sunburn. Internally, the beta particle energy will be deposited in living tissue. However, there is less energy deposited per cell than with an alpha particle, so

**Table 2-1**

**Radioactive Sources Potentially Present  
Burial Mound at Rideout Field  
Fort McClellan, Calhoun County, Alabama**

<b>Radioisotope</b>	<b>Half-Life (years)</b>	<b>Decay Products</b>	<b>Energy</b>	
Cobalt 60	5.27	Beta	318	KeV
		Gamma	1.173	MeV
		Gamma	1.332	MeV
Cesium 137	30.17	Beta	512	KeV
		Gamma	662	KeV
Strontium 90	29	Beta	.546	MeV
Yttrium 90	64 (hours)	Beta	2.28	MeV

KeV = Kilo electron volt  
MeV = Mega electron volt

there is less risk the energy may result in changes to the cell. For energy deposited by a beta particle, the fate of the cells remains the same as with alpha particles.

Gamma rays are high-energy, short-wavelength rays. With the exception of the higher energy, they are similar to light rays. These high-energy rays can travel long distances in air and in matter. Unlike beta particles, they have no well-defined range in matter. They can travel through material without depositing any energy, or they may be completely absorbed. However, since they can travel large distances in air and matter, there is little energy deposited per unit path length or in any one cell. For this reason, gamma rays are considered to cause whole body irradiation and are not considered an internal hazard, as gamma rays emitted inside the body may not deposit any energy traveling through the body.

Given this information, the radioactive contaminants represent an external dose concern. External radioactive contaminants that give off gamma rays and beta particles represent external exposure to the body, but the ray and particle energy can be deposited in the skin and body of workers. This energy deposition represents the worker dose.

The beta particles also represent an internal dose concern when these materials enter the body through inhalation, ingestion, or injection. Once in the body, there are few methods available for removal, so the energy of the particles is deposited in the internal tissue, thus giving dose to the organ in which the material is deposited. The body is normally shielded from beta radiation by use of clothing (PPE) and safety glasses for eye protection.

The rules that govern worker exposure to radioactive materials found in 10 Code of Federal Regulations 20 will be followed throughout this project. This will include a program as low as reasonably achievable.

### **2.1.2 UXO Avoidance**

In addition to the radioisotopes noted, the presence of UXO is possible at the Burial Mound site. It will be necessary to conduct UXO avoidance activities as outlined in the site-specific ordnance and explosives avoidance work plan (See site-specific unexploded ordnance safety plan attached to this work plan). Surface sweeps and downhole surveys of soil brings will be required to support field activities, and will be conducted to identify anomalies for the purpose of UXO avoidance.

### 3.0 Personal Protective Equipment

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The work activities will begin in the following levels of protection. Also, a complete description of Level D, Modified Level D, and Level C PPE is provided.

Task	Initial Level of PPE
Staging equipment	Level D
Collecting samples	Modified Level D*
Install monitoring wells	Modified Level D*

\* Initial level will be raised to Level C or higher if air monitoring results for volatile organic hydrocarbons in the worker's breathing zone (BZ) are greater than action levels. If radiation monitoring indicates levels greater than 1.5 times background, operations will cease and the health physics technician will contact the project manager and the senior health physicist for further guidance.

**Level D.** The minimal level of protection that will be required of IT Corporation personnel at the site will be Level D. The following equipment will be used for Level D protection:

- Coveralls or work clothing
- Leather work gloves (when necessary)
- Steel-toed safety boots
- Safety glasses
- Hard hat
- Hearing protection (when working near operating equipment).

Note: UXO personnel should not wear hard hats and steel-toed shoes when engaged in ordnance operations unless a significant overhead hazard exists. Where overhead hazards exist, a chin strap will be worn with hard hats to prevent accidental falling of hard hat.

**Modified Level D.** The following equipment will be used for Level D-Modified protection:

- Permeable Tyvek, Kleenguard, or its equivalent
- Latex boot covers
- Nitrile or latex inner gloves; leather work gloves (outer) when necessary
- Steel-toed safety boots
- Safety glasses
- Hard hat

## 4.0 Site Monitoring

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Potential environmental contaminants of concern resulting from the well installation at the Burial Mound site are Co-60, Cesium-137, and Strontium-90. A health physics technician will monitor for any increase above background radiation during site operations.

While there are no anticipated chemical hazards that will be encountered, a calibrated photoionization detector/organic vapor analyzer will be utilized to monitor the sampling locations and BZs to determine if any organic material may be present that would necessitate upgrading of protection level. A calibrated combustible gas/oxygen indicator will be utilized to monitor the work areas and BZs to determine if any combustible/flammable oxygen levels may be present that would necessitate evacuation of the work area. Table 4-1 contains action levels for site monitoring. Table 4-2 contains the air monitoring frequency and location for site monitoring at the work sites.

**Unexploded Ordnance.** UXO safety will be achieved by employing UXO specialists to ensure that field personnel do not come into contact with UXO. In areas where UXO is suspected to exist, the UXO specialists will perform the following UXO avoidance operations.

- **Area UXO Surveys Using Magnetometers.** During this operation, UXO on the surface will be detected and marked for avoidance during field operations. Metal objects just below the surface (within 2 feet) will also be marked to indicate the potential hazard.
- **Downhole UXO Surveys.** UXO specialists will perform downhole magnetometer surveys to detect metal objects in the path of the boring apparatus until undisturbed soils are reached. The boring location will be moved if subsurface metal objects are detected.

If UXO is encountered, personnel will contact the site manager, UXO specialist, and the site safety and health officer immediately. Personnel will evacuate the immediate area and secure it. The UXO hazard will be dealt with by appropriate personnel according to the procedures addressed in the site-specific UXO safety plan attachment.

**Table 4-1**  
**Action Levels**  
**Burial Mound at Rideout Field**  
**Fort McClellan, Calhoun County, Alabama**

(Page 1 of 2)

When in Level C Personal Protective Equipment (PPE)

Analyte	Action Level	Required Action <sup>a</sup>
Volatile Organic Compounds (VOC)	$\geq 10$ ppm above background in breathing zone (BZ)	Stop work, evacuate work area, upgrade to Level B.
Oxygen	$\geq 20\%$ , $\leq 23\%$ $< 20\%$ , $> 23\%$	Normal operations. Stop work, evacuate work area.
Flammable vapors	$\geq 10\%$ LEL $< 10\%$ LEL	Stop work, evacuate work area. Continue operations, monitor for VOCs.
Gamma emitting radionuclides	1.5 times background	Stop work, notify senior health physicist and certified industrial hygienist (CIH).

When in Level D Modified/D PPE

Analyte	Action Level	Required Action <sup>b</sup>
VOCs	$\geq 5$ ppm above background in BZ	Stop activities, suspend work activities for 15 to 30 minutes, if readings are sustained then upgrade to Level C PPE.
Oxygen	$\geq 20\%$ , $\leq 23\%$ $< 20\%$ , $> 23\%$	Normal operations. Stop work, evacuate work area.
Flammable vapors	$\geq 10\%$ LEL $< 10\%$ LEL	Stop work, evacuate work area. Continue operations, monitor for VOCs.
Gamma emitting radionuclides	1.5 times background	Stop work, notify senior health physicist and CIH.

**Table 4-1**

**Action Levels  
Burial Mound at Rideout Field  
Fort McClellan, Calhoun County, Alabama**

(Page 2 of 2)

When in Support Zone

Analyte	Action Level	Required Action
VOCs	$\geq 1$ ppm above background in BZ	Evacuate support zone and re-establish perimeter of exclusion zone.
Gamma emitting radionuclides	Determine background	None.

<sup>a</sup> Four instantaneous peaks in any 15-minute period or a sustained reading for 5 minutes in excess of the action level will trigger a response.

<sup>b</sup> Contact with the H&S manager must be made prior to continuance of work. The H&S manager may then initiate perimeter/integrated air sampling along with additional engineering controls.

**No one is permitted to downgrade levels of PPE without authorization from the H&S manager.**



**Table 4-2**

**Air Monitoring Frequency and Location  
Burial Mound at Rideout Field  
Fort McClellan, Calhoun County, Alabama**

Work Activity	Instrument	Frequency	Location
Staging equipment	Micro R meter	Initially to determine background	BZ of employees
	OV Monitor	Initially for area	BZ of employees
Land Survey	OV Monitor	Initially for area	BZ of employees
Sampling (water, sediment, and soil)	OV Monitor	Continuously	BZ of employees and/or work area
	LEL/O <sub>2</sub> Monitor	Continuously	BZ of employees and/or work area
	Micro R meter	Continuously	BZ and samples
Installing monitoring wells	OV Monitor	Continuously	BZ of employees and/or work area
	LEL/O <sub>2</sub> Monitor	Continuously	BZ of employees and/or work area
	Micro R meter	Continuously	BZ and work area

OV = Organic vapor.

LEL/O<sub>2</sub> = Lower explosive level/oxygen.

Micro R meter = meter to determine radiation levels measured as micro REM.

BZ = Breathing zone.

## **5.0 Activity Hazard Analysis**

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The attached activity hazard analysis (Table 5-1) is provided for the following activities:

- Setup of equipment and general field activities
- Land survey
- Installation of monitoring wells
- Water sampling.

All injuries and illnesses must be immediately reported to the site manager or the site safety and health officer, who will then notify off-site personnel and organizations as necessary.

If hospital care must be provided, the victim shall be treated at Northeast Regional Medical Center. Directions to the hospital are provided in Figure 5-1.

**Table 5-1**

**Activity Hazard Analysis  
Burial Mound at Rideout Field  
Fort McClellan, Calhoun County, Alabama**

(Page 1 of 11)

Activity	Potential Hazards	Recommended Controls
Staging equipment	Unexploded ordnance (UXO)	<ul style="list-style-type: none"> <li>UXO specialists will perform UXO surface clearance and/or UXO downhole clearance for UXO avoidance. See site-specific safety and health plans (SSHP) to determine if required.</li> </ul>
	Slip, trip, and fall hazards	<ul style="list-style-type: none"> <li>Determine best access route before transporting equipment.</li> <li>Practice good housekeeping; keep work area picked up and clean as feasible.</li> <li>Continually inspect the work area for slip, trip, and fall hazards.</li> <li>Look before you step ensure safe and secure footing.</li> </ul>
	Heavy lifting	<ul style="list-style-type: none"> <li>Use proper lifting techniques. Lifts greater than 60 pounds require assistance or mechanical equipment.</li> </ul>
	Falling objects	<ul style="list-style-type: none"> <li>Stay alert and clear of materials suspended overhead; wear hard hat and steel-toed boots.</li> </ul>
	Flying debris, dirt, dust, etc.	<ul style="list-style-type: none"> <li>Wear safety glasses/goggles; ensure that eyewash is in proper working condition.</li> </ul>
	Pinch points	<ul style="list-style-type: none"> <li>Keep hands, fingers, and feet clear of moving/suspended materials and equipment.</li> <li>Beware of contact points.</li> <li>Stay alert at all times!</li> </ul>
	Cuts/bruises	<ul style="list-style-type: none"> <li>Use cotton or leather work gloves for material handling.</li> </ul>
	Bees, spiders, and snakes	<ul style="list-style-type: none"> <li>Inspect work area carefully and avoid placing hands and feet into concealed areas.</li> </ul>
	Ticks	<ul style="list-style-type: none"> <li>Wear light colored clothing (can see ticks better).</li> <li>Mow vegetated and small brush areas.</li> <li>Wear insect repellent.</li> <li>Wear long sleeves and long pants.</li> <li>Visually check oneself promptly and frequently after exiting the work area.</li> </ul>
	Fire	<ul style="list-style-type: none"> <li>Fire extinguishers shall be suitably placed, distinctly marked, readily accessible, and maintained in a fully charged and operable condition.</li> </ul>

**Table 5-1**

**Activity Hazard Analysis  
Burial Mound at Rideout Field  
Fort McClellan, Calhoun County, Alabama**

(Page 2 of 11)

Activity	Potential Hazards	Recommended Controls
Staging equipment (continued)	Contact with moving equipment/vehicles	<ul style="list-style-type: none"> <li>• Work area will be barricaded/demarcated.</li> <li>• Equipment will be laid out in an area free of traffic flow.</li> </ul>
	Hazard communication	<ul style="list-style-type: none"> <li>• Label all containers as to contents and dispose of properly.</li> <li>• Ensure Material Safety Data Sheets (MSDS) are available for hazardous chemicals used on site.</li> </ul>
	Noise	<ul style="list-style-type: none"> <li>• Sound levels above 85 decibels (dBA) mandate hearing protection.</li> </ul>
	Lighting	<ul style="list-style-type: none"> <li>• Adequate lighting will be provided to ensure a safe working environment.</li> </ul>
	Cold stress	<ul style="list-style-type: none"> <li>• Workers should wear insulated clothing when temperatures drop below 40 degrees Fahrenheit (°F).</li> <li>• Drink warm beverages on breaks. Refrain from drinking caffeinated beverages.</li> <li>• Remove wet clothing promptly.</li> <li>• Take breaks in warm areas.</li> <li>• Reduce work periods as necessary.</li> <li>• Layer work clothing.</li> </ul>
	Poison ivy/oak/sumac	<ul style="list-style-type: none"> <li>• Avoid plant areas if possible.</li> <li>• Wear long sleeves and long pants.</li> <li>• Promptly wash clothing that has contacted poisonous plants.</li> <li>• Wash affected areas immediately with soap and water.</li> </ul>
	Heat rash	<ul style="list-style-type: none"> <li>• Keep the skin clean and dry.</li> <li>• Change perspiration-soaked clothing, as necessary.</li> <li>• Bathe at end of work shift or day.</li> <li>• Apply powder to affected area.</li> </ul>
	Heat cramps	<ul style="list-style-type: none"> <li>• Drink plenty of cool fluids even when not thirsty.</li> <li>• Provide cool fluid for work crews.</li> <li>• Move victim to shaded, cool area.</li> </ul>

**Table 5-1**

**Activity Hazard Analysis  
Burial Mound at Rideout Field  
Fort McClellan, Calhoun County, Alabama**

(Page 3 of 11)

Activity	Potential Hazards	Recommended Controls
Staging equipment (continued)	Heat exhaustion	<ul style="list-style-type: none"> <li>• Conduct physiological worker monitoring as needed (i.e., heart rate, oral temperature).</li> <li>• Set up work/rest periods.</li> <li>• Use the buddy system.</li> <li>• Allow workers time to acclimate.</li> <li>• Have ice packs available for use.</li> <li>• Take frequent breaks.</li> </ul>
	Heat stroke	<ul style="list-style-type: none"> <li>• Evaluate possibility of night work.</li> <li>• Perform physiological monitoring on workers during breaks.</li> <li>• Wear body cooling devices.</li> </ul>
	Contact with moving equipment/vehicles	<ul style="list-style-type: none"> <li>• Work area will be barricaded/demarcated.</li> <li>• Equipment will be laid out in an area free of traffic flow.</li> <li>• Barricades shall be used on or around work areas when it is necessary to prevent the inadvertent intrusion of pedestrian traffic.</li> <li>• Barriers shall be used to protect workers from vehicular traffic.</li> <li>• Barriers shall be used to guard excavations adjacent to streets or roadways.</li> <li>• Flagging shall be used for the short term (less than 24 hours) to identify hazards until proper barricades or barriers are provided.</li> <li>• Heavy equipment shall have backup alarms.</li> </ul>
	Forklift operations	<ul style="list-style-type: none"> <li>• Use qualified and trained forklift operators.</li> <li>• The operator shall not exceed the load capacity rating for the forklift.</li> <li>• The load capacity shall be clearly visible on the forklift.</li> <li>• Forklift operators shall inform their supervisor of any prescribed medication that they are taking that would impair their judgement.</li> </ul>
	Portable electric tools	<ul style="list-style-type: none"> <li>• Portable electric tools that are unsafe due to faulty plugs, damaged cords, or other reasons, shall be tagged (do not use) and removed from service.</li> <li>• Portable electric tools and all cord and plug connected equipment shall be protected by a ground fault circuit interrupter (GFCI) device.</li> <li>• Electrical tools shall be inspected daily prior to use.</li> </ul>

**Table 5-1**

**Activity Hazard Analysis  
Burial Mound at Rideout Field  
Fort McClellan, Calhoun County, Alabama**

(Page 4 of 11)

Activity	Potential Hazards	Recommended Controls
Staging equipment (continued)	Extension cords	<ul style="list-style-type: none"> <li>• Extension cords that have faulty plugs, damaged insulation, or are unsafe in any way shall be removed from service.</li> <li>• Cords shall be protected from damage from sharp edges, projections, pinch points (doorways), and vehicular traffic.</li> <li>• Cords shall be suspended with a nonconductive support (rope, plastic ties, etc.).</li> <li>• Cords shall be designed for hard duty.</li> <li>• Cords shall be inspected daily.</li> </ul>
	Lightning strikes	<ul style="list-style-type: none"> <li>• Whenever possible, halt activities and take cover.</li> <li>• If outdoors, stay low to the ground.</li> <li>• Limit the body surface area that is in contact with the ground (i.e., kneeling on one knee is better than laying on the ground).</li> <li>• Seek shelter in a building if possible.</li> <li>• Stay away from windows.</li> <li>• If available, crouch under a group of trees instead of one single tree.</li> <li>• Keep all body parts in contact with the ground as close as possible.</li> <li>• Remain 6 feet away from tree trunk if seeking shelter beneath tree(s).</li> <li>• If in a group, keep 6 feet of distance between people.</li> </ul>
	Thunderstorms, tornadoes	<ul style="list-style-type: none"> <li>• Listen to radio or TV announcements for pending weather information.</li> <li>• Cease field activities during thunderstorm or tornado warnings.</li> <li>• Seek shelter. Do not try to outrun a tornado.</li> </ul>
Surveying	Slip, trip, and fall hazards	<ul style="list-style-type: none"> <li>• Site workers will be required to wear hard hat, safety glasses with side shields, work gloves, and steel-toe boots when working in the field.</li> <li>• Provide adequate lighting in all work areas.</li> <li>• Whenever possible, avoid routing cords and hoses across walking pathways.</li> <li>• Flag or cover inconspicuous holes to protect against falls.</li> <li>• Work areas will be kept clean and orderly.</li> <li>• Garbage and trash will be disposed of daily in approved refuse containers.</li> <li>• Tools and accessories will be properly maintained and stored.</li> <li>• Work areas and floors will be kept free of dirt, grease, and slippery materials.</li> </ul>
	UXO	<ul style="list-style-type: none"> <li>• UXO specialists will perform UXO surface clearance for UXO avoidance.</li> </ul>

**Table 5-1**

**Activity Hazard Analysis  
Burial Mound at Rideout Field  
Fort McClellan, Calhoun County, Alabama**

(Page 5 of 11)

Activity	Potential Hazards	Recommended Controls
Surveying (continued)	Traffic accidents	<ul style="list-style-type: none"><li>• Place physical barrier (i.e., barricades, fencing) around work areas regularly occupied by pedestrians.</li><li>• If working adjacent to roadways, have workers wear fluorescent orange vests.</li><li>• Use warning signs or lights to alert oncoming traffic.</li><li>• Assign flag person(s) if necessary to direct local traffic.</li><li>• Set up temporary parking locations outside the immediate work area.</li><li>• Motor vehicle operators shall obey all posted traffic signs, signals, and speed limits.</li><li>• Pedestrians have the right-of-way.</li><li>• Wear seat belts when vehicles are in motion.</li></ul>
	Wildlife hazards	<ul style="list-style-type: none"><li>• Workers should be cautious when driving through the site in order to avoid encounters with passing animals.</li></ul>
	Biological hazards	<ul style="list-style-type: none"><li>• Walking through overgrown grass areas, watch for snakes (rattlesnakes, moccasins, and copperheads).</li></ul>
	Ticks	<ul style="list-style-type: none"><li>• Wear light colored clothing (can see ticks better).</li><li>• Mow vegetated and small brush areas.</li><li>• Wear insect repellant.</li><li>• Wear long sleeves and long pants.</li><li>• Visually check oneself promptly and frequently after exiting the work area.</li></ul>
	Poison ivy/oak/sumac	<ul style="list-style-type: none"><li>• Avoid plant areas if possible.</li><li>• Wear long sleeves and long pants.</li><li>• Promptly wash clothing that has contacted poisonous plants.</li><li>• Wash affected areas immediately with soap and water.</li></ul>
Groundwater sampling	Cross-contamination and contact with potentially contaminated materials	<ul style="list-style-type: none"><li>• Sampling technicians will wear proper protective clothing and equipment to safeguard against potential contamination.</li><li>• Avoid skin contact with water.</li><li>• Handle samples with care.</li><li>• Only essential personnel will be in the work area.</li><li>• Real-time air monitoring will take place before and during sampling activities.</li><li>• All personnel will follow good hygiene practices.</li><li>• Proper decontamination procedures will be followed.</li><li>• All liquids and materials used for decontamination will be contained and disposed of in accordance with federal, state, and local regulations.</li></ul>

**Table 5-1**

**Activity Hazard Analysis  
Burial Mound at Rideout Field  
Fort McClellan, Calhoun County, Alabama**

(Page 6 of 11)

Activity	Potential Hazards	Recommended Controls
Groundwater sampling (continued)	UXO	<ul style="list-style-type: none"> <li>UXO specialists will perform UXO surface clearance and/or UXO downhole clearance for UXO avoidance.</li> </ul>
	Cut hazards	<ul style="list-style-type: none"> <li>Use care when handling glassware.</li> <li>Wear adequate hand protection.</li> </ul>
	Hazard communication	<ul style="list-style-type: none"> <li>MSDSs shall be obtained for chemicals brought on site.</li> <li>Label all containers as to contents.</li> </ul>
	Strains/sprains	<ul style="list-style-type: none"> <li>Use the proper tool for the job being performed.</li> <li>Get assistance if needed.</li> <li>Avoid twisting/turning while pulling on tools, moving equipment, etc.</li> </ul>
	Drowning	<ul style="list-style-type: none"> <li>Personal flotation devices will be worn when sampling on or adjacent to the water.</li> </ul>
	Spills/residual materials	<ul style="list-style-type: none"> <li>Absorbent material and containers will be kept available where leaks or spills may occur.</li> </ul>
	Lighting	<ul style="list-style-type: none"> <li>Adequate lighting will be provided to ensure a safe working environment.</li> </ul>
	Unattended worker	<ul style="list-style-type: none"> <li>Use "buddy system" - visual contact will be maintained with the sampling technician during sampling activities.</li> </ul>
Installation of monitoring wells	Overhead hazards	<ul style="list-style-type: none"> <li>Make sure no obstacles are within radius of boom. Always stay a safe distance from power lines.</li> </ul>
	Faulty or damaged equipment being utilized to perform work	<ul style="list-style-type: none"> <li>All machinery or mechanized equipment will be inspected by a competent mechanic and be certified to be in safe operating condition.</li> <li>Equipment will be inspected before being put to use and at the beginning of each shift.</li> <li>Faulty/unsafe equipment will be tagged and if possible locked out.</li> <li>Drill rigs and geoprobes shall be equipped with reverse signal alarm, backup warning lights, or the vehicle is backed up only when an observer signals it is safe to do so.</li> </ul>



**Table 5-1**

**Activity Hazard Analysis  
Burial Mound at Rideout Field  
Fort McClellan, Calhoun County, Alabama**

(Page 7 of 11)

Activity	Potential Hazards	Recommended Controls
Installation of monitoring wells (continued)	Heat rash	<ul style="list-style-type: none"> <li>• Keep the skin clean and dry.</li> <li>• Change perspiration-soaked clothing, as necessary.</li> <li>• Comply with IT Procedure HS 400 (May 13, 1999).</li> <li>• Bathe at end of work shift or day.</li> <li>• Apply powder to affected area.</li> </ul>
	Heat cramps	<ul style="list-style-type: none"> <li>• Drink plenty of cool fluids even when not thirsty.</li> <li>• Provide cool fluid for work crews.</li> <li>• Comply with IT Procedure HS 400 (May 13, 1999).</li> <li>• Move victim to shaded, cool area.</li> </ul>
	Heat exhaustion	<ul style="list-style-type: none"> <li>• Conduct physiological worker monitoring as needed (i.e., heart rate, and oral temperature).</li> <li>• Set up work/rest periods.</li> <li>• Use the "buddy system."</li> <li>• Comply with IT Procedure HS 400 (May 13, 1999).</li> <li>• Allow workers time to acclimate.</li> <li>• Have ice packs available for use.</li> <li>• Take frequent breaks.</li> </ul>
	Heat stroke	<ul style="list-style-type: none"> <li>• Evaluate possibility of night work.</li> <li>• Perform physiological monitoring on workers during breaks.</li> <li>• Wear body cooling devices.</li> <li>• Comply with IT Procedure HS 400 (May 13, 1999).</li> </ul>
	UXO	<ul style="list-style-type: none"> <li>• UXO specialists will perform UXO surface clearance and/or UXO downhole clearance for UXO avoidance.</li> </ul>
	Uneven terrain, poor ground support, inadequate clearances, contact with utilities	<ul style="list-style-type: none"> <li>• Inspections or determinations of road conditions and structures shall be made in advance to ensure that clearances and load capacities are safe for the passage or placing of any machinery or equipment.</li> <li>• All mobile equipment and areas in which they are operated shall be adequately illuminated.</li> <li>• Aboveground and belowground utilities will be located prior to staging equipment.</li> <li>• Whenever the equipment is parked, the parking brake shall be set.</li> <li>• Equipment parked on inclines will have the wheels chocked.</li> <li>• Inspect brakes and tire pressure on drill rig before staging for work.</li> </ul>

**Table 5-1**

**Activity Hazard Analysis  
Burial Mound at Rideout Field  
Fort McClellan, Calhoun County, Alabama**

(Page 8 of 11)

Activity	Potential Hazards	Recommended Controls
Installation of monitoring wells (continued)	Inexperienced operator	<ul style="list-style-type: none"> <li>Machinery and mechanized equipment shall be operated only by designated personnel.</li> <li>Operators shall inform their supervisor(s) of any prescribed medication that they are taking that would impair their judgment.</li> </ul>
	Jacks/outriggers	<ul style="list-style-type: none"> <li>Ensure proper footing and cribbing.</li> </ul>
	Falling objects	<ul style="list-style-type: none"> <li>Remove unsecured tools and materials before raising or lowering the derrick.</li> <li>Stay alert and clear of materials suspended overhead.</li> </ul>
	Pinch points	<ul style="list-style-type: none"> <li>Keep feet and hands clear of moving/suspended materials and equipment.</li> <li>Stay alert at all times!</li> </ul>
	Fire	<ul style="list-style-type: none"> <li>Mechanized equipment shall be shut down prior to and during fueling operations.</li> <li>Have fire extinguishers inspected and readily available.</li> <li>Obtain a Hot Work Permit, per IT Procedure HS 314 (May 19, 1999) for any operation which could act as an ignition source.</li> </ul>
	Fall hazards	<ul style="list-style-type: none"> <li>Personnel are not allowed to work off of machinery or use them as ladders.</li> <li>Use fall protection when working above 6 feet.</li> </ul>
	Noise	<ul style="list-style-type: none"> <li>Hearing protection is mandatory above 85 dBA.</li> </ul>
	Contact with rotating or reciprocating machine parts	<ul style="list-style-type: none"> <li>Use machine guards; use long-handled shovels to remove auger cuttings.</li> <li>Safe lockout procedures for maintenance work.</li> </ul>
	Heavy lifting	<ul style="list-style-type: none"> <li>Use proper lifting techniques. Lifts greater than 60 pounds require assistance or mechanical equipment; size up the lift.</li> </ul>
	Slip, trip, and fall hazards	<ul style="list-style-type: none"> <li>Practice good housekeeping, keep work area picked up and clean as feasible.</li> <li>Continually inspect the work area for slip, trip, and fall hazards.</li> </ul>

**Table 5-1**

**Activity Hazard Analysis  
Burial Mound at Rideout Field  
Fort McClellan, Calhoun County, Alabama**

(Page 9 of 11)

Activity	Potential Hazards	Recommended Controls
Installation of monitoring wells (continued)	Contact with potentially contaminated materials	<ul style="list-style-type: none"> <li>• Real time air monitoring will take place. Proper personal protective clothing and equipment will be utilized.</li> <li>• Stop immediately at any sign of obstruction.</li> <li>• Do not breathe air surrounding boring any more than necessary.</li> <li>• Upgrade to respirator if necessary.</li> <li>• Avoid skin contact with soil cuttings. Wear gloves.</li> <li>• Stay clear of moving parts of drill rig and geoprobe.</li> </ul>
	Drum handling	<ul style="list-style-type: none"> <li>• Be careful not to breathe air from around open drum any more than necessary. Monitor with photoionization detector/flame ionization detector (PID/FID) equipment and upgrade to respirator if necessary.</li> <li>• When filling a drum (with either soil or water), be careful not to make contact with the contained waste. Wear appropriate gloves. Make sure lid or bung of drum is secure.</li> <li>• If moving a drum unassisted, be sure to leverage properly, use proper lifting techniques, and wear safety glasses and steel-toed boots.</li> <li>• When using a drum dolly, make sure straps and lid catch are securely attached. Leverage properly when tilting drum. Be sure toes stay away from drum.</li> </ul>
Moving and shipping collected samples	Heavy lifting	<ul style="list-style-type: none"> <li>• Use proper lifting techniques. Lifts greater than 60 pounds require assistance or mechanical equipment; size-up the lift.</li> </ul>
	Pinch points	<ul style="list-style-type: none"> <li>• Keep hands, fingers, and feet clear of moving/suspended materials and equipment.</li> <li>• Beware of contact points.</li> <li>• Stay alert at all times!</li> </ul>
	Cut hazards	<ul style="list-style-type: none"> <li>• Wear adequate hand protection. Use care when handling glassware.</li> </ul>
	Hazard communication	<ul style="list-style-type: none"> <li>• Label all containers as to contents and associated location</li> </ul>
Material storage	Flammable and combustible liquids	<ul style="list-style-type: none"> <li>• Identify all hazardous materials with proper labels.</li> <li>• Store in NO SMOKING AREA.</li> <li>• Fire extinguisher readily available.</li> <li>• Transfer only when properly grounded and bonded.</li> </ul>

**Table 5-1**

**Activity Hazard Analysis  
Burial Mound at Rideout Field  
Fort McClellan, Calhoun County, Alabama**

(Page 10 of 11)

Activity	Potential Hazards	Recommended Controls
Disposal of investigation-derived waste (IDW) (Forklift Operation)	Personnel injury, property damage, and/or equipment damage	<ul style="list-style-type: none"> <li>• Use qualified and trained forklift operators.</li> <li>• The operator shall not exceed the load capacity rating for the forklift.</li> <li>• The load capacity shall be clearly visible on the forklift.</li> <li>• Forklift operators shall inform their supervisor of any prescribed medication that they are taking that would impair their judgement.</li> </ul>
	Cross-contamination and contact with potentially contaminated materials	<ul style="list-style-type: none"> <li>• Stop immediately at any sign of obstruction.</li> <li>• Sampling technicians will wear proper protective clothing and equipment to safeguard against potential contamination.</li> <li>• Only essential personnel will be in the work area.</li> <li>• Real-time air monitoring will take place before and during sampling activities.</li> <li>• All personnel will follow good hygiene practices.</li> <li>• Proper decontamination procedures will be followed.</li> <li>• All liquids and materials used for decontamination will be contained and disposed of in accordance with federal, state, and local regulations.</li> </ul>
	Cut hazards	<ul style="list-style-type: none"> <li>• Use care when handling glassware.</li> <li>• Wear adequate hand protection.</li> </ul>
High-pressure water jetting operations	Heavy lifting	<ul style="list-style-type: none"> <li>• Use proper lifting techniques.</li> <li>• Lifts greater than 60 pounds require assistance or mechanical equipment; size-up the lift.</li> </ul>
	Slip, trip, and fall hazards	<ul style="list-style-type: none"> <li>• Good housekeeping shall be implemented.</li> <li>• The work area shall be kept clean as feasible.</li> </ul> <p>Inspect the work area for slip, trip, and fall hazards.</p>
	Fueling	<ul style="list-style-type: none"> <li>• Only approved safety cans shall be used to store fuel.</li> <li>• Do not refuel equipment while it is operating.</li> <li>• Fire extinguishers shall be suitably placed, distinctly marked, readily accessible, and maintained in a fully charged and operable condition.</li> </ul>

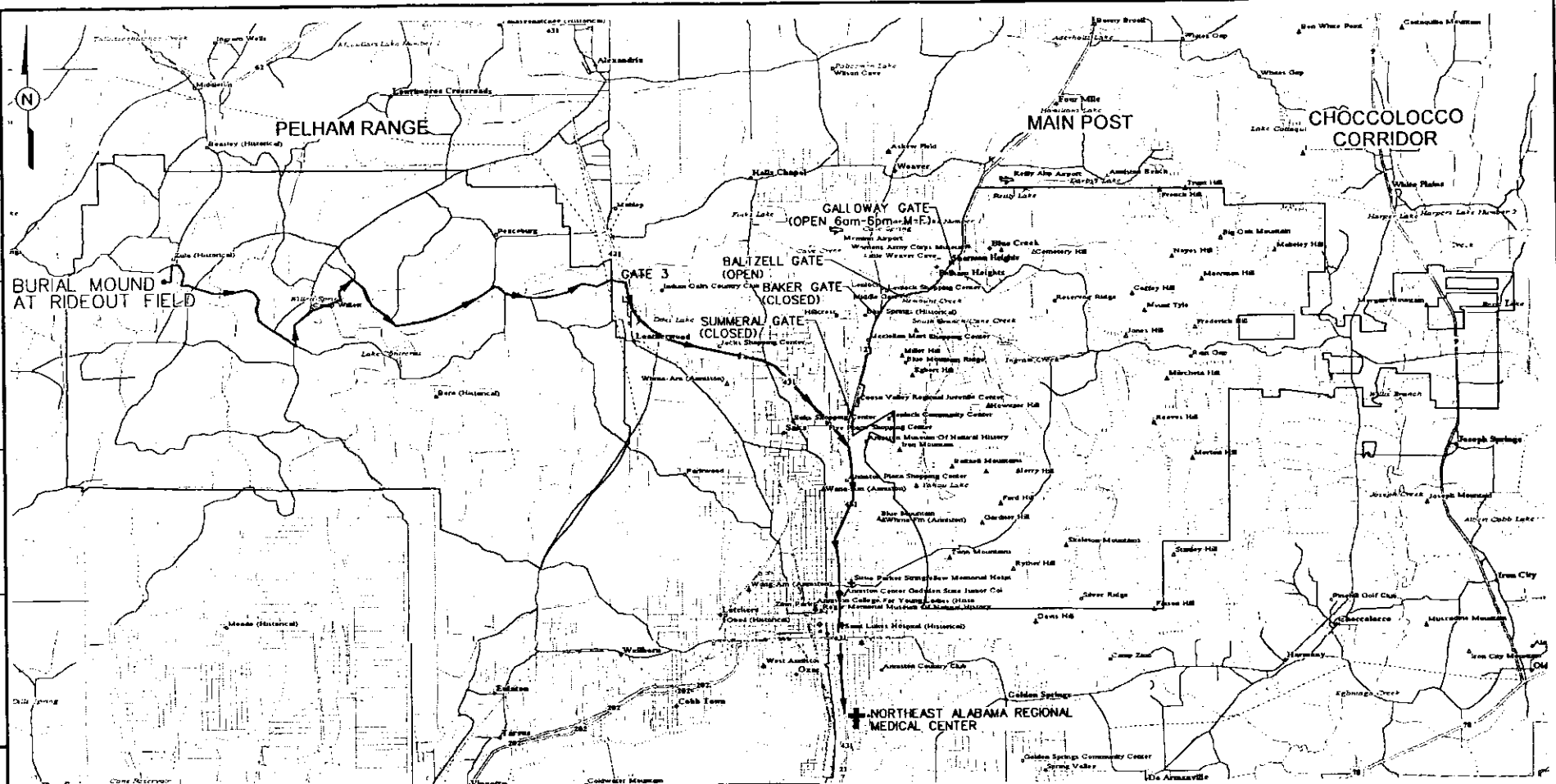
**Table 5-1**

**Activity Hazard Analysis  
Burial Mound at Rideout Field  
Fort McClellan, Calhoun County, Alabama**

(Page 11 of 11)

Activity	Potential Hazards	Recommended Controls
High-pressure water jetting operations (continued)	Faulty or damaged equipment	<ul style="list-style-type: none"> <li>Equipment shall be inspected before being placed into service and at the beginning of each shift.</li> <li>Preventive maintenance procedures recommended by the manufacturer shall be followed.</li> <li>A lockout/tagout procedure shall be used for equipment found to be faulty or undergoing maintenance.</li> </ul>
	High-pressure water	<ul style="list-style-type: none"> <li>Jetting gun operator must wear appropriate PPE including hard hat, impact-resistant safety glasses with side shields, water-resistant clothing, metatarsal guards for feet and legs, and hearing protection (if appropriate).</li> <li>One standby person shall be available within the vicinity of the pump during jetting operation.</li> <li>The work area shall be isolated and adequate barriers will be used to warn other site personnel.</li> </ul>
	Unqualified operators	<ul style="list-style-type: none"> <li>Only qualified and trained personnel are permitted to operate machinery and mechanized equipment associated with water jet cutting and cleaning.</li> </ul>
	Out of control equipment	<ul style="list-style-type: none"> <li>No machinery or equipment is permitted to run unattended.</li> <li>Machinery or equipment will not be operated in a manner that will endanger persons or property nor will the safe operating speeds or loads be exceeded.</li> </ul>
	Noise	<ul style="list-style-type: none"> <li>Sound levels above 85 dBA mandates hearing protection by nearby site personnel.</li> </ul>
	Activation during repairs	<ul style="list-style-type: none"> <li>All machinery or equipment will be shut down and positive means taken to prevent its operation while repairs or manual lubrications are being done.</li> </ul>
	Pinch points	<ul style="list-style-type: none"> <li>Keep feet and hands clear of moving/suspended materials and equipment.</li> <li>Stay alert and clear of materials suspended</li> </ul>
	Falling objects	<ul style="list-style-type: none"> <li>Hard hats are required by site personnel.</li> <li>Stay alert and clear of material suspended overhead.</li> </ul>
	Flying debris	<ul style="list-style-type: none"> <li>Impact-resistant safety glasses with side shields are required.</li> </ul>
	Contact with potentially contaminated materials	<ul style="list-style-type: none"> <li>All site personnel will wear the appropriate PPE.</li> </ul>

05:16/01 STARTING DATE: 12/30/00 DATE LAST REV: DRAFT CHECK BY: NITATOR: J. BROWN DWG NO.: 13746-545-595  
 08:47:51 AM DRAWN BY: D. B. LINGSLEY PROJ. NO.: 774645 PROJ. MGR.: J. YACOB

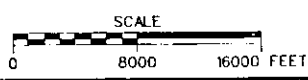


**LEGEND:**

- ➔ ROUTE TO NORTHEAST ALABAMA REGIONAL MEDICAL CENTER
- 431 U.S. HIGHWAY
- ⛶ HOSPITAL
- INVESTIGATION SITES

**DRIVING DIRECTIONS FROM PELHAM RANGE GATE 3 TO THE NORTHEAST ALABAMA MEDICAL CENTER**

- EXIT PELHAM RANGE AT GATE NO. 3 AND TURN RIGHT ON U.S. HWY 431
- CONTINUE TO WHERE AL HWY 21 MERGES WITH U.S. HWY 431 AND CONTINUE SOUTH
- CONTINUE SOUTH ON AL21/US431 FOR ~ 2.7 MILES
- TURN LEFT ONTO EAST 10TH STREET
- GO ~ 0.2 MILE TO MEDICAL CENTER ON RIGHT
- NORTHEAST ALABAMA REGIONAL MEDICAL CENTER, 400 EAST 10 TH STREET
- PHONE NUMBER : (256) 235-5121



**FIGURE 5-1  
HOSPITAL EMERGENCY ROUTE**

U. S. ARMY CORPS OF ENGINEERS  
 MOBILE DISTRICT  
 FORT MCLELLAN  
 CALHOUN COUNTY, ALABAMA  
 Contract No. DACA21-96-D-0018

**IT CORPORATION**  
 A Member of The IT Group

**ATTCHMENT 1**  
**PELHAM RANGE EMERGENCY ROUTE**  
**AND**  
**RANGE CONTROL CONTACT**

## **Pelham Range Emergency Routes**

- Range Control will determine, depending on the wind direction, the best egress route.
- Range Control will advise over the radio which route to take.
- Four routes have been indicated on the enclosed map.

## **Medical Emergency**

- Exit gate Number 3 at Pelham Range
- Turn right onto Route 431
- Turn right onto Highway 21 (Quintard)
- Turn left onto 10<sup>th</sup> Street
- Hospital is 1-1/2 blocks ahead:

Northeast Alabama Regional Medical Center  
400 East 10<sup>th</sup> Street  
Anniston, Alabama

## **Range Control-Pelham Range**

- Building 1120, Ft McClellan  
Phone No. 848-6772  
Fax No. 848-4412.

**All access permits are issued by range control, daily.**



## **FORT MCCLELLAN ALERT AND NOTIFICATION SYSTEM**

An outdoor electronic alert and notification system is operational on Fort McClellan and Pelham Range. The purpose of this system is to provide warning(s) of an emergency situation that poses a threat to the safety and health of personnel on Fort McClellan and Pelham Range. The system has the capability of providing digital voice, electronic tone alerts and live voice loudspeaker warnings of emergency situations. The following is a list of the digital voice and associate tone alerts for the various hazards that could threaten personnel on both portions of the installation:

1. **THIS IS A TEST!** This is a test of the Fort McClellan emergency warning system. **THIS IS A TEST AND ONLY A TEST!** **WAIL TONE**

This message is used for the monthly test on the first Tuesday at 1600 hrs.

2. **WARNING! TORNADO WARNING!** A tornado warning has been issued for this area. Seek shelter immediately. Tune to a local radio station. Seek shelter immediately. **TORNADO WARNING!** **SOLID TONE**

3. **WARNING! SEVERE WEATHER WARNING!** A severe weather warning has been issued for this area. Standby for further instructions. Tune to a local radio station. **SEVERE WEATHER WARNING!** **SOLID TONE**

4. **WARNING! THUNDERSTORM WARNING!** A thunderstorm warning has been issued for this area. Standby for further instructions. Tune to a local radio station. **THUNDERSTORM WARNING!** **SOLID TONE**

5. **WARNING! HAZARDOUS MATERIALS ACCIDENT!** There has been a hazardous materials accident. Standby for further instructions. Tune to a local radio station. **HAZARDOUS MATERIALS ACCIDENT!** **HI-LO TONE**

6. **WARNING!** Anniston Army Depot has announced a chemical agent release. Standby for further instructions. Tune to FM 100 radio station. **CHEMICAL AGENT RELEASE!** **WHOO TONE**

7. **ALL CLEAR!** The emergency situation is over. **ALL CLEAR!** The emergency situation is over. **ALL CLEAR!** **NO TONE**

8. **CHEMICAL ALERT!** Initiate evacuation procedures immediately. A chemical agent release has occurred at Anniston Army Depot. **EVACUATE IMMEDIATELY! CHEMICAL ALERT!** **WHOO TONE**

This voice message was specifically designed for Pelham Range.

Sequence of initial alert and notification is:

**VOICE MESSAGE--TONE--VOICE MESSAGE--TONE**  
repeated twice, again as the situation warrants.

Enclosure One

## **FORT MCCLELLAN ALERT AND NOTIFICATION SYSTEM**

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3. **WARNING! SEVERE WEATHER WARNING!** A severe weather warning has been issued for this area. Standby for further instructions. Tune to a local radio station. **SEVERE WEATHER WARNING!** **SOLID TONE**

4. **WARNING! THUNDERSTORM WARNING!** A thunderstorm warning has been issued for this area. Standby for further instructions. Tune to a local radio station. **THUNDERSTORM WARNING!** **SOLID TONE**

5. **WARNING! HAZARDOUS MATERIALS ACCIDENT!** There has been a hazardous materials accident. Standby for further instructions. Tune to a local radio station. **HAZARDOUS MATERIALS ACCIDENT!** **HI-LO TONE**

6. **WARNING!** Anniston Army Depot has announced a chemical agent release. Standby for further instructions. Tune to FM 100 radio station. **CHEMICAL AGENT RELEASE!** **WHOO TONE**

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repeated twice, again as the situation warrants.

Enclosure One

TECHNICAL ASSUMPTIONS  
For  
Modification No. 2 to Task Order CK10  
Contract No. DACA21-96-D-0018  
WAD No. 13

**Airborne Gamma Radionuclide Survey of Fort McClellan (Main Post and Pelham Range), Anniston Alabama**

## **INTRODUCTION**

The contractor shall perform an Airborne Gamma Radionuclide survey for two separate areas at the former U.S. Army Installation, Fort McClellan, Calhoun County, Alabama. One large area is located in the northwest portion of Pelham Range. The second is a small area on the Main Post area. The purpose of the survey is to identify if there are any detectable radiological sources, what the sources are ( $^{137}\text{Cs}$  or  $^{60}\text{Co}$ ), and to define a source area small enough to pinpoint source locations using follow ground surveys.

## **HISTORY**

Radiological training was conducted on the Main Post during the early 1950's and Pelham Range during the 1960's using both  $^{137}\text{Cs}$  and  $^{60}\text{Co}$  as radiological sources. The original source strength was between 2-4 curies. The manufacture date for sources used on the Main Post is 1952. Sources used on Pelham Range were manufactured during the early 1960's. There is no recoverable record for the disposition of these sources.

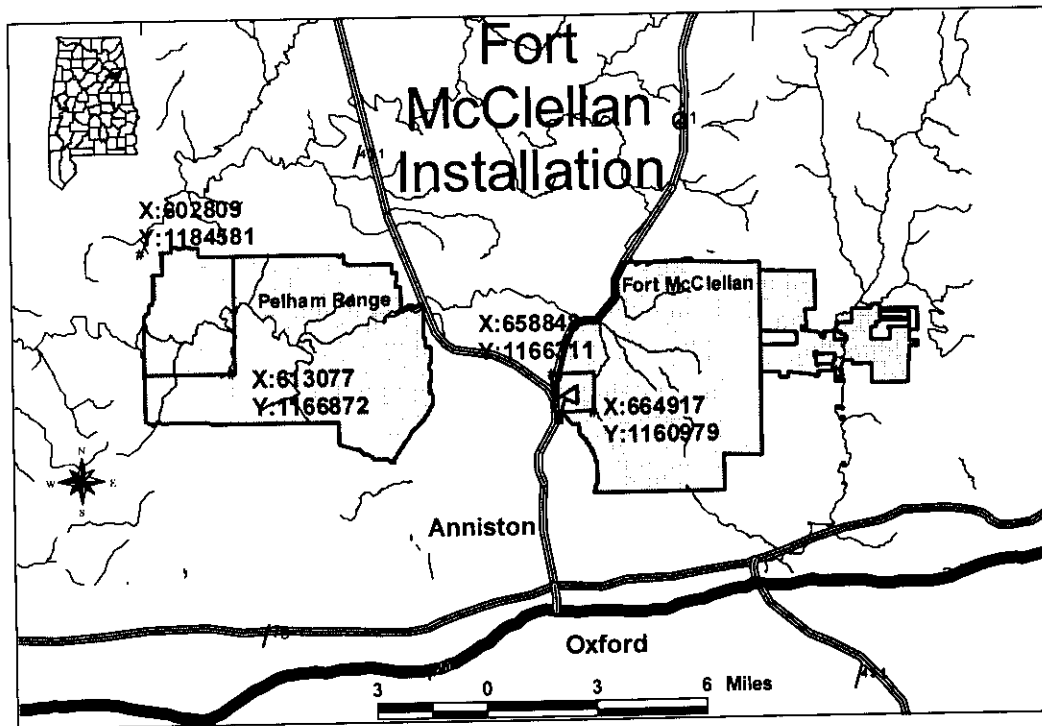
The training facility on Pelham Range consisted of button sources on actuators (similar to sprinklers). The exact location is not known. Radiological sources were placed on actuators and, when activated, raised from beneath the ground to allow trainers to detect and find the sources. After this training program was discontinued, it is believed that the sources were properly removed and the actuators bulldozed into a pile with surface soils. It is unknown whether this debris was buried, pushed into a pit, or removed from the area.

The maximum potential depth of contamination for the Pelham Range area is believed to be 3-4 feet. The maximum potential depth for the Main Post area is believed to be 6 feet.

## **AREA DESCRIPTION**

The Fort McClellan facility is located in Calhoun County Alabama on the northern end of the town of Anniston (Figure 1). The facility is split into the Main Post/Choccolocco Corridor area to the east and Pelham Range to the west. The areas of

potential contamination are identified in Figure 1. The area defined on Pelham Range is approximately 4852 acres and the area on the Main Post is approximately 732 acres. Coordinates for the corners of each of the rectangular areas defined on the map are in feet using the Alabama State Plane Coordinate system East Zone, North American Datum 1983.



**Figure 1. Area map of the Fort McClellan study areas.**

Plates 1 and 2 are close-up maps of the Pelham Range and Main Post study areas respectively. The Pelham Range area is mostly covered in a mixture of deciduous and coniferous trees. The terrain is moderately rolling hills. The area is used for military field training exercises and thus has few man-made structures that may present obstacles to low-level flying. The Main Post area is heavily treed with a mixture of hardwood and deciduous tree species. The terrain is more severe. There are several buildings and electric utility lines in this area, as indicated on the map.

#### **AVAILABLE DATA**

There is recent (1998) digital map data for the Main Post area including aerial photography, planimetric layers, elevation models (5 foot contours and dtms), etc available in Microsoft DGN format and ArcInfo/ArcView format. Pelham Range data

are based on 1994 flyovers. Digital data are also available for this area, however the elevation data are only 20-foot contour intervals. All data are based on 1:200 scale National Map Accuracy Standards.

## **DELIVERABLES**

The contractor shall plan to attend one on-site visit prior to commencement of the actual airborne survey. The purpose of this meeting will be to coordinate schedules, obtain necessary access to facilities, and brief regulators (EPA, State, and NRC) on the work to be conducted.

Flight plans will be coordinated and filed with appropriate base personnel. All data collected during the survey will be delivered in the form of digital data logs, video tapes, GPS reports, etc. Final Reports will be delivered to include maps which define levels of gamma activity and source type ( $^{137}\text{Cs}$  or  $^{60}\text{Co}$ ). These maps shall also be delivered in digital format in the form of CAD (dxf, dgn, or dwg) or GIS (ESRI format) files.

The contractor's proposal should provide a complete description of the proposed methodology including descriptions of sensors, aircraft, GPS equipment, analysis tools, etc. For the purposes of this proposal, the contractor should assume that a helicopter flying at approximately 270 feet above land surface at 10-meter line spacing would be sufficient to conduct the survey. The contractor may propose alternative flying heights and flight line spacing with technical justifications/limitations for each scenario. For instance, descriptions of methodologies should discuss the ability to detect a button source of "X" micro-Curies buried a foot deep.