Final
Site-Specific Work Plan

Ordnance and Explosives (OE) Removal Action
Eastern Bypass
Revision 3

Fort McClellan, Alabama

Task Order 0010
Contract Number DACA87-99-D-0010

U.S. Army Corps of Engineers
Engineering and Support Center
Huntsville, Alabama

Geographical Corps District:
US Army Corps of Engineers, Mobile District

Prepared by
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Ft. McClellan, Alabama

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List of Acronyms

°F	Fahrenheit
AHA	Activity Hazard Analysis
ARARs	Applicable and Relevant and Appropriate Requirements
ASP	Ammunition Supply Point
BRAC	Base Realignment and Closure
CD-RW	Compact Disc - Read/Write
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CIH	Certified Industrial Hygienist
CO	Contracting Officer
CWM	Chemical Warfare Material
DDESB	Defense Department Explosives Safety Board
DERP	Defense Environmental Restoration Program
DGPS	Differential Global Positioning System
DID	Data Item Description
DOD	Department of Defense
EBP	Eastern Bypass
EE/CA	Engineering Evaluation/Cost Analysis
EHS	Environmental Health and Safety
EM	Electromagnetic
EMM	Earth Moving Machinery
EOD	Explosive Ordnance Disposal
EODT	Explosive Ordnance Technologies Inc.
ESS	Explosives Safety Submission
FAR	Federal Acquisition Regulation
FMC	Fort McClellan
FWENC	Foster Wheeler Environmental Corporation
GIS	Geographical Information System
HE	High Explosive
HTRW	Hazardous, Toxic and Radioactive Waste
ID	Identification
JPA	Joint Powers Authority
LE	Low Explosive
MPM	Most Probable Munition
msl	Mean Sea Level
NCP	National Contingency Plan
NCR	Non Conformance Report
NTCRA	Non Time Critical Removal Actions
OE	Ordnance & Explosive
OEW	Ordnance and Explosive Waste
OOU	Ordnance Operable Unit
PESM	Project Environmental & Safety Manager
PM	Project Manager
PVC	Poly Vinyl Chloride
QA	Quality Assurance

QASAS	Quality Assurance Specialist Ammunition Surveillance
QC	Quality Control
Q-D	Quantity – Distance
RCP	Regulatory Compliance Plan
RLS	Registered Land Surveyor
RMP	Risk Management Plan
RTS	Robotic Total Station
SOP	Standard Operating Procedure
SOW	Statement of Work
SSHP	Site Safety and Health Plan
SSWP	Site Specific Work Plan
SUXOS	Senior UXO Supervisor
SWWP	Site Wide Work Plan
TDEM	Time Domain Electromagnetic
TFHQ	Transition Force Headquarters
TIP	Task Initiation Procedure
TO	Task Order
U.S.	United States
USAESCH	United States Army Engineering and Support Center Huntsville
USRADS	Ultrasonic Ranging and Detection System
UXO	Unexploded Ordnance
UXOQCS	UXO Quality Control Specialist
UXOSO	UXO Safety Officer
VL	Verification Level

1.0 INTRODUCTION

1.1 GENERAL

1.1.1 This is a site-specific work plan prepared for the execution of Task Order 0010, Ordnance and Explosives (OE) Removal Action Eastern Bypass. The works are being carried out as a component of contract DACA87-9-D-0010, Ordnance and Explosives Response at Fort McClellan, Alabama.

1.1.2 This Work Plan is being prepared under the Defense Environmental Restoration Program (DERP) for Base Realignment and Closure (BRAC), which was established as part of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), more widely known as "Superfund." Public law requires that government facilities subject to closure and subsequent reuse be subject to remediation under CERCLA for Non-time Critical Removal Actions (NTCRA). Activities conducted in support of this project will be conducted in a manner consistent with CERCLA and the National Contingency Plan (NCP).

1.1.3 The proposed Eastern Bypass right–of-way was divided into three Ordnance Operable Units (OOUs). OOU1 is the northwestern portion consisting of approximately 103 acres in non-impact training areas. OOU2 is the central portion consisting of approximately 225 acres within known impact areas. OOU3 is the southern portion consisting of approximately 259 acres in areas with no known historical OE usage. A one-foot clearance has been performed over the entire OOU1 area and the majority of the OOU2 area. 'No Further Action' is the selected action for OOU1 and OOU3. A removal action in accordance with the signed Action Memorandum for the Eastern Bypass for OOU2 will be performed.

1.1.4 A clearance to one foot below grade of unexploded ordnance (UXO) and OE items has been performed over all of OOU1 and the majority of the OOU2 area by EODT. Several small areas in OOU2 that were not cleared before EODT terminated operations will be addressed within this Task Order. The Mobile District Corps of Engineers is currently administering a contract for the removal of all marketable trees within the OOU1 and OOU2 areas of the Eastern Bypass prior to work commencing under this Task Order. A General Site Wide Work Plan (SWWP) was prepared for execution of OE response projects at Fort McClellan; this site-specific work plan is an extension of the SWWP.

1.1.5 Review comments and responses have been included as Appendix A in this final submittal of this work plan.

1.1.6 Additional 40.7-Acre Removal. An additional 40.7 acres was added on the periphery of OOU2 due to a change in the alignment of the ALDOT design files of the Eastern Bypass (EBP) Right of Way (ROW). This removal is being carried out in conjunction with the original 225 acres and conforms to the scope of the original removal.

1.1.7 Armored Mechanical Removal. Several areas within the alignment were known to be extensively contaminated with OE, OE Scrap and Non-OE Scrap from the data provided by Zapata Engineering (EE/CA) and EODT's 1 foot removal action. Initial intrusive investigations indicated that continuing to manually excavate these areas was both cost prohibitive and ineffective, therefore an armored mechanical protocol was formulated to clear the contaminated areas. A combination of armored earth-moving equipment and mechanical screening apparatus was scoped to carry out the removal along with an innovative use of a heavy-duty low-speed, high-torque metal shredder for demilitarizing the OE Scrap.

1.2 OBJECTIVE

1.2.1 The objective of this Task Order is to perform a removal action for all OE (UXO and inert ordnance) within project defined size/depth parameters for the Eastern Bypass at Fort McClellan (FMC), Alabama. This clearance is a final removal action prior to transfer of the Eastern Bypass property to the Alabama Department of Transportation for construction of a highway, in accordance with the Joint Powers Authority (JPA) Land Reuse Plan.

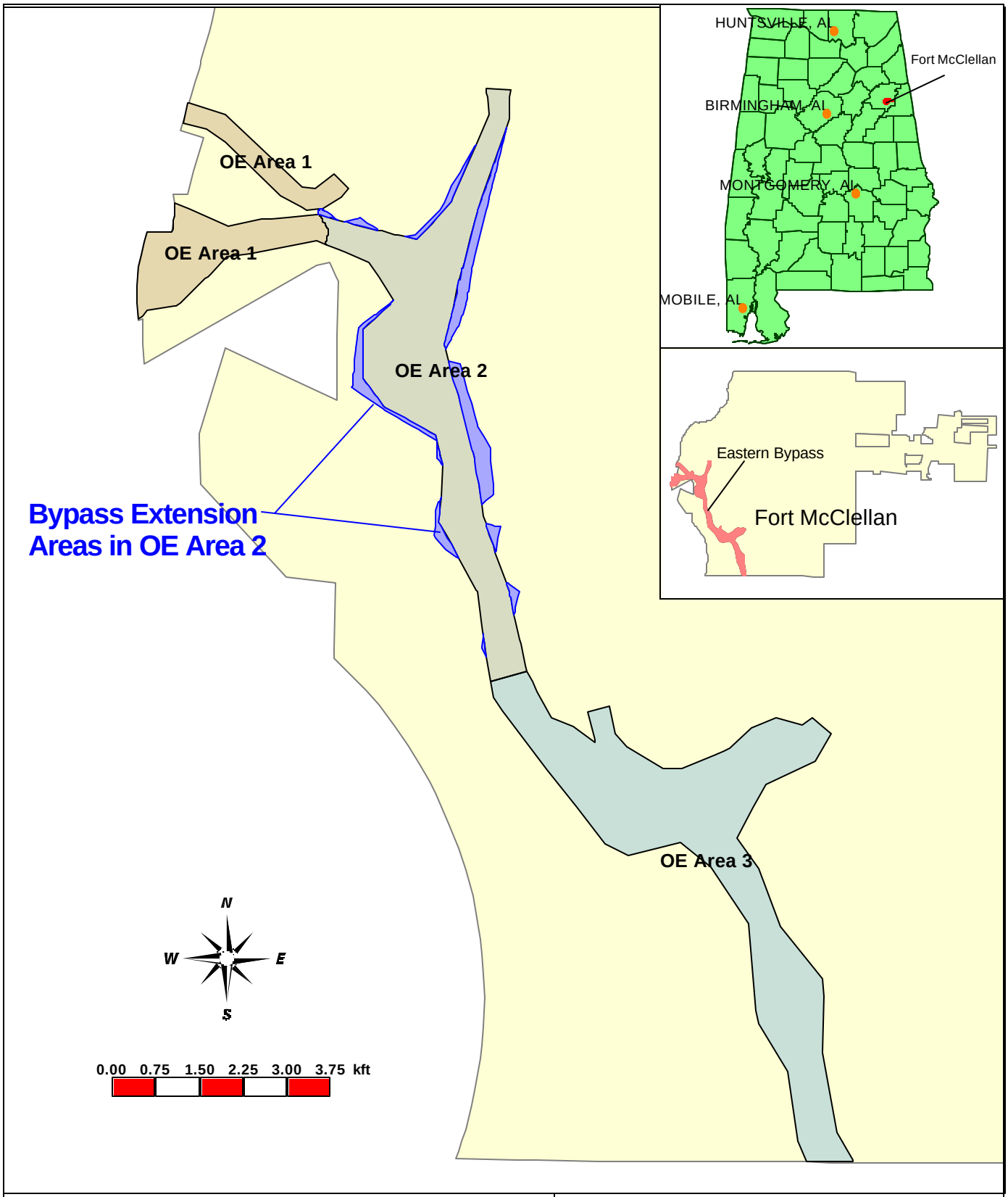
1.3 SITE LOCATION

1.3.1 Fort McClellan is located northeast of the City of Anniston in Calhoun County, Alabama. The areas known as Weaver and Blue Mountain are to the West, with the City of Jacksonville to the North and the Talladega Forest to the East of the post. **Figure 1.1** shows the location of the Eastern Bypass OE Removal Area. **Figure 1.2** shows the location of the Mechanical Removal Area, Mechanical Processing Area, and the Shredder/Disposal Area within the Eastern Bypass Right of Way.

1.4 SITE HISTORY

1.4.1 Fort McClellan has been used for artillery training of troops and the National Guard as early as 1912 to present day. In 1941, McClellan became the site of the Chemical Corps Training Command. In 1962, the U.S. Army Combat Developments Command Chemical Biological-Radiological Agency moved to Fort McClellan. In 1973, the Chemical Corps School along with the U.S. Army Combat Developments Command Chemical Biological-Radiological Agency closed. In 1979, the U.S. Army Chemical Corps School re-established along with a training Brigade for Basic Training.

1.4.2 Fort McClellan was recommended for closure in BRAC 95, and the Base was closed in September 1999. At this time, local, state, and federal interests are deciding the future use of Fort McClellan. A Transition Team is now in place to facilitate disposition of Fort McClellan properties to private ownership and/or transfer to other government entities.



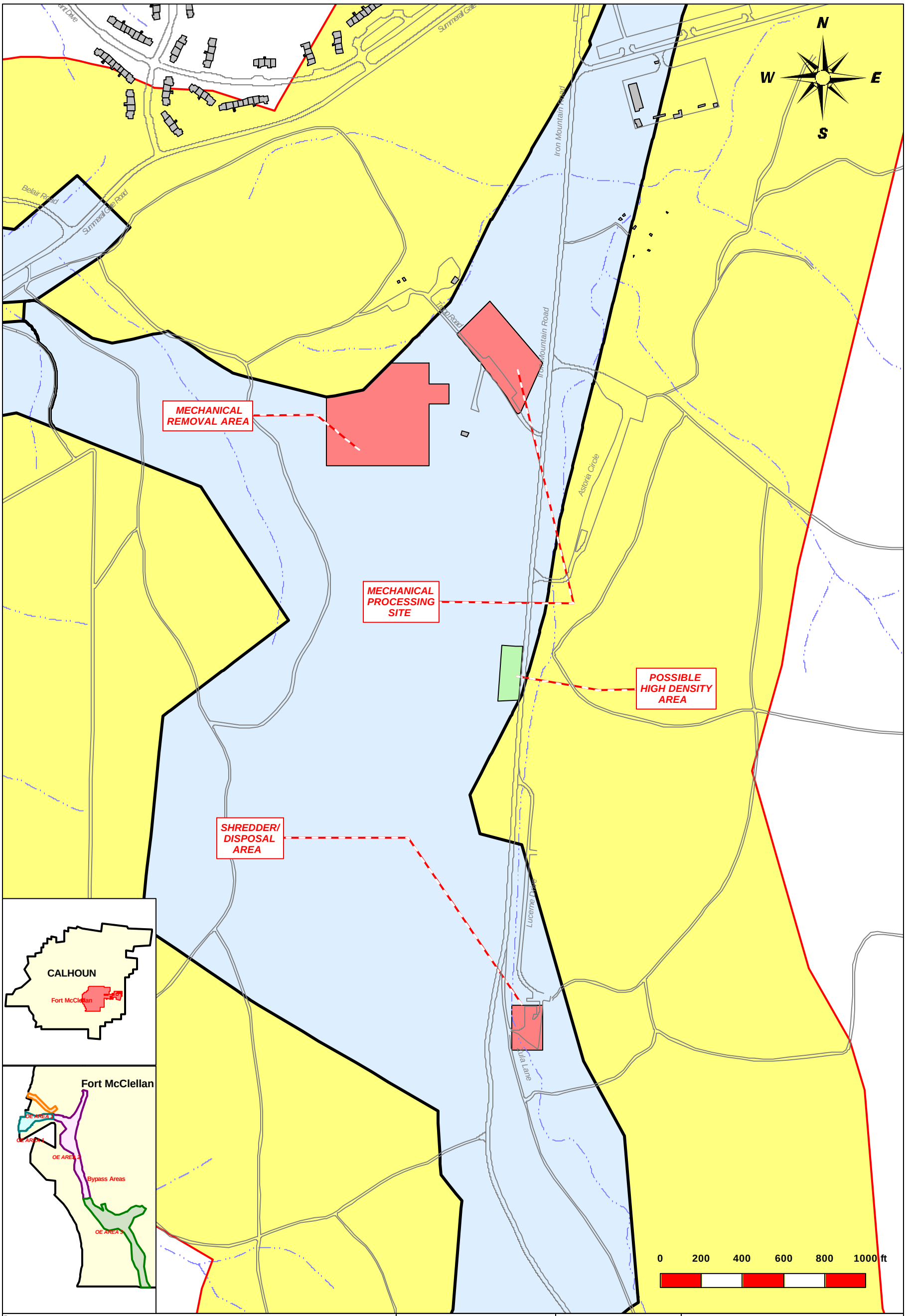
FOSTER WHEELER ENVIRONMENTAL CORPORATION

HU:DCR

Figure 1.1
Location of Eastern Bypass

Fort McClellan
Calhoun County
Alabama

October 2002


N
W
E
S
Summeral Gate Road
Iron Mountain Road
Belair Road
Summeral Gate Road
Tiller Road
Iron Mountain Road
Astoria Circle
MECHANICAL REMOVAL AREA
MECHANICAL PROCESSING SITE
POSSIBLE HIGH DENSITY AREA
SHREDDER/ DISPOSAL AREA
Lucerne Drive
Ursula Lane
CALHOUN
Fort McClellan
Fort McClellan
OE AREA 1
OE AREA 2
OE AREA 3
Bypass Areas
0 200 400 600 800 1000 ft
Areas of Concern
Possible High Density Area
Eastern Bypass Area
Eastern Bypass 1181' EZ
Buildings
FOSTER WHEELER ENVIRONMENTAL CORPORATION
Fort McClellan, Calhoun County, Anniston, Alabama
October 2002
Figure 1.2
SITE MAP

1.4

1.4.3 Several previous site investigations in and around the Eastern Bypass have indicated the presence of OE training items within the OOU1 area. The OOU2 area encompasses known impact areas. These activities as well as potential OE items that may be found within the EBP are described in the Final Engineering Evaluation/Cost Analysis prepared by Zapata Engineering dated April 2000. EODT has completed a surface clearance to 1 foot in the entire OOU1 area and the majority of the grids in the OOU2 area in support of pre-construction activities. The remaining grids will be cleared by Foster Wheeler Environmental within this Task Order. The boundaries of OOU1 and OOU2 have been adjusted since finalization of the EBP EE/CA to better reflect the nature of past use indicative of the types of ordnance found during the EODT clearance and the final removal on the M2 parcel. These boundaries as defined in the Draft Final Action Memorandum allow OOU1 to be defined as a training area, while OOU2 incorporates several range fans, including a 60mm mortar range, a 2.36-inch rocket range, and a tank range.

1.5 TOPOGRAPHY

1.5.1 The topographic gradient at the site generally increases towards the south and east of the main installation. Local relief on Fort McClellan is in excess of 1,320 feet. The lower elevations (700 feet above mean sea level [msl]) occur along Cane Creek, near Baltzell Gate Road, while the maximum elevations (2,063 feet above msl) occur on Choccolocco Mountain, which traverses the area in a north/south direction, with the steep easterly slopes grading abruptly into Choccolocco Valley. The western slopes are more continuous, with the southern extension maintaining elevations up to 900 feet above msl near the western reservation boundary. The northern extension decreases in elevation in the vicinity of Reilly Airfield. The central portion of Fort McClellan is characterized by flat to gently sloping land.

1.6 CLIMATE

1.6.1 Fort McClellan is situated in a temperate, humid climate. Summers are hot and long, and winters are usually short and mild to moderately cold. The climate is influenced by frontal systems moving from northwest to southeast, and temperatures change rapidly from warm to cool due to the inflow of northern air. The average annual temperature is 63 degrees Fahrenheit (ºF). Summer temperatures usually reach 90ºF or higher about 70 days per year, but temperatures above 100ºF are rare. Freezing temperatures are common but are usually of short duration. The first frost may arrive by late October. At Anniston, the average date of the first 32ºF temperature is November 6, and the last is March 30. This provides a growing season of 221 days. Snowfall averages 0.5 to 1 inch. On rare occasions, several inches of snow accumulate from a single storm (ESE, 1997).

1.6.2 The average annual rainfall is approximately 53 inches and is well distributed throughout the year. The more intense rains usually occur during the warmer months, and some flooding occurs nearly every year. Approximately 80 percent of the flood-producing storms are of the frontal type and occur in the

winter and spring, lasting from 2 to 4 days each. Summer storms are usually thunderstorms with intense precipitation over small areas, and these sometimes result in serious local floods. Occasionally, several wet years or dry years occur in series. Annual rainfall records indicate no characteristic order or pattern (ESE, 1997). The past few years in Alabama have exhibited mild drought conditions and similar conditions are predicted later this summer.

1.6.3 Winds in the Fort McClellan area are seldom strong and frequently blow down the valley from the northeast. However, there is no truly persistent wind direction. Normally, only light breezes or calm prevail, except during passages of cyclonic disturbances, when destructive local wind storms develop, some into tornadoes, with winds of 100 miles per hour or more (ESE, 1997).

2.0 TECHNICAL MANAGEMENT PLAN

2.1 GENERAL

2.1.1 In accordance with USAESCH DID **OE-005-02**, **Technical Management Plan**, the following items have been addressed and are included within **Section 2.0 - Technical Management Plan** of the SWWP:

a. Identification of guidance, regulations, or other policy under which the OE operations will be conducted **(SWWP – paragraph 2.1.1 to paragraph 2.1.5)**;
b. Discussion, assumptions, and procedures to be followed relating to the discovery of CWM on a conventional ordnance site **(SWWP – paragraph 2.1.6)**;
c. Procedures to be followed in the event unexploded ordnance (UXO) cannot be destroyed onsite, if planned **(SWWP – paragraph 2.1.7)**; and
d. Procedures to follow if an unidentified UXO is located **(SWWP – paragraph 2.1.7)**.

2.1.2 A Regulatory Compliance Plan (RCP) for OE response activities at Fort McClellan is presented in **Section 2.1 - Regulatory Compliance**, of the SWWP. The plan discusses potential Applicable and Relevant and Appropriate Requirements (ARARs) and requirements to be considered (TBCs) for the investigation and management of OE at Fort McClellan.

2.1.3 This OE removal action will be performed in a manner consistent with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 104, and the National Contingency Plan (NCP) Sections 300.120(c) and 300.400(e). No Federal, State or Local permits should be required for any access or remedial action taken on this site for the activities within this statement of work. The applicable provisions of 29 CFR 1910.120 shall apply.

2.2 TECHNICAL SCOPE

2.2.1 The Statement of Work (SOW) supplied for this Task Order consists of:

a. **Task 1** - Preparation of Site Specific Work Plan and Conventional Explosives Safety Submission
b. **Task 2** - Location Surveys, Site Preparation and Mapping;
c. **Task 3** - Geophysical Mapping and Preparation of Dig Sheets;
d. **Task 4** - Unexploded Ordnance Removal, Turn In of Inert Ordnance and Metallic Debris, and Perform Quality Control; and
e. **Task 5** - Prepare and Submit Site Specific Removal Report.
f. **Task 6** – Modification to Workplan to accommodate additional 40 acres to right-of-way
g. **Task 7** – Location Surveys and Mapping – Boundary and Grid Setout;

h. **Task 8** – Brush Clearance – removal of brush and trees up to 6 inches within additional 40 acres;
i. **Task 9** – Perform UXO Clearance and Range Residue Management on additional 40 acres;
j. **Task 10** – Perform Quality Control on Additional 40 acres;
k. **Task 11** – Removal Report;
l. **Task 12** – Prepare Work Plan and Conventional Explosive Safety Submission Changes;
m. **Task 13** - Perform Location Surveys at the Specified Target Area and Adjoining Areas Designated for Mechanical Removal;
n. **Task 14** – Prepared Final Amendment to Explosive Safety Submittal
o. **Task 15** - Vegetation Removal and Disposal;
p. **Task 16** - Perform Mechanical Excavation and Separation of UXO/OE like items for Clearance at the Specified Target Zone and Adjoining High OE Density Areas;
q. **Task 17** - Perform Demolition, Demilitarization, AEDA/Range Residue Management and Disposal of all UXO/OE like Items from the Specified Target Zone and Adjoining High OE Density Areas;
r. **Task 18** – Perform Quality Control at the Specified Target Zone and Adjoining High OE Density Areas
s. **Task 19** – Removal Report;
t. **Task 20** - Equipment Repair Due to Explosive Damage and/or UXO Clearance Work, In Support of Task 16 Work.

2.2.2 In accordance with USAESCH DID **OE-005-01, Type II Work Plan**, a copy of the Statement of Work is contained at **Appendix B – Statement of Work**.

2.3 APPROACH

2.3.1 The following approach is proposed in order to satisfy the intent of the Statement of Work:

2.3.2 **Task 1** – Prepare Site Specific Work Plan (SSWP) and Conventional Explosives Safety Submission (ESS)

2.3.2.1 **Site Specific Work Plan.** This SSWP for the Eastern Bypass shall include site specific details as required by USAESCH DID **OE-005-1, Type II Work Plan** that are not covered by the SWWP for Fort McClellan. No site work will commence until approval of this SSWP.

2.3.2.2 **Conventional Explosives Safety Submission.** The ESS is a separate document that is being prepared in accordance with USAESCH DID **OE-060, Conventional Explosives Safety Submission**. The SSWP and the ESS will be submitted together. Tasks 1 to 3 can begin prior to approval of the ESS, although OE removal operations under Task 4 will not begin until the ESS has received final approval.

2.3.2.3 The Task Order Manager is primarily responsible for the preparation of the SSWP and ESS with input and review from the appropriate subject matter experts. The Draft SSWP and Draft ESS shall be submitted within 21 days after award of the Task Order. The Final SSWP and Final ESS shall be submitted within 10 workdays after receipt of the comments on the drafts.

2.3.3 **Task 2** – Location Surveys, Site Preparation and Mapping

2.3.3.1 FWENC shall perform all processes under this task in accordance with the Statement of Work and USAESCH DID **OE-005-7, Location Surveys and Mapping Plan**.

2.3.3.2 **Boundary Delineation.** As a first step in this task, a data file of the State Plane co-ordinates of the boundary of OOU2 (investigation area) will be prepared by the FWENC GIS Manager in accordance with the locations shown in the final Action Memorandum for the Eastern Bypass prepared by Zapata Engineering. A sub-contract Registered Land Surveyor (RLS) shall set out this boundary utilizing this data file with a precision-surveying instrument. Distinctively marked wooden stakes at a spacing of two hundred foot or as required will be placed to delineate the investigation boundary.

2.3.3.3 **Site Preparation.** The Mobile District Corps of Engineers is currently administering a contract for the removal of all marketable trees within the OOU1 and OOU2 boundaries. The harvesting of these trees will leave a significant amount of debris including standing non-marketable trees and brush that will have to be reduced and removed to enable subsequent geophysical investigation. Sub-contract mechanical and manual brush removal will be utilized on this task. Note that no grubbing will be carried out in this sub-contract. The selected sub-contractor will field suitable equipment and operators; FWENC will provide UXO liaison and QC as required. The grids that were not completed by EODT before they terminated operations will not be cleared by the brush clearance sub-contract mechanically before they have been cleared to at least 12 inches below grade by Foster Wheeler Environmental. Manual brush clearance may be carried out after a surface clearance has been completed by Foster Wheeler Environmental.

2.3.3.4 **Grid Setout.** In order to set out the 100' x 100' grid corners for the investigation, the Site Preparation component of Task 2, namely brush and debris removal will be carried out first. Note that this and the previous marketable tree removal will most likely destroy any previously set grid stakes. A data file containing the State Plane co-ordinates of the previously set EODT grid corners shall be supplied to the Grid Setout Team as for the previous task. After the investigation area is progressively cleared of brush and debris, a Grid Setout Team shall setout the grid corners utilizing precision-surveying methods to closer than one foot.

2.3.3.5 **Ordnance and OE Locations.** Further survey and mapping procedures shall be utilized during Task 4 that will locate recovered UXO and inert ordnance

items in State Plane co-ordinates to within plus or minus one foot. Ordnance scrap, ordnance fragments, shrapnel, small arms ammunition and metallic debris shall be recorded only on a per-grid basis and not located by co-ordinates.

2.3.3.6 **Task Deliverables.** The following items shall be supplied to the Contracting Officer as part of the task:

a. A tabulated list of the respective grid corners for all grids being cleared in the areas described in the Statement of Work; and
b. Electronic and hard copies of all drawing files used for and developed as part of the removal action. These will meet the requirements listed in the Statement of Work.

2.3.4 **Task 3** – Geophysical Mapping and Preparation of Dig Sheets

2.3.4.1 **Geophysical Mapping.** FWENC shall provide the necessary personnel and equipment to carry out geophysical mapping of the investigation area. The primary tool utilized will be the EM-61 (one-meter coil) with positional data provided by the Ultrasonic Ranging and Detection System (USRADS), Differential Global Positioning System (DGPS), Vulcan Spatial Measurement System or Robotic Total Station as appropriate. Note that due to excessive slope or other factors, some areas may not be able to be effectively geophysically mapped. These areas will be identified from the geophysical mapping data and addressed on an individual basis by other conventional UXO investigation. Further detail of these procedures is contained in **Chapter 5 – Geophysical Investigation Plan**.

2.3.4.2 **Target Selection.** The data collected during the Geophysical Mapping process will be utilized to select targets for excavation in Task 4. A combination of on-site geophysicists and geophysicists from the FWENC Denver Office will conduct the necessary analysis of the data in order to enable the production of dig-sheets. Further detail of this process is contained in **Chapter 5 – Geophysical Investigation Plan**. Sampling of a proportion of targets will be carried out during all phases of the Target Selection process in order to calibrate the anomaly picks.

2.3.4.3 QC processes to be carried out in this task are explained in further detail in **Chapter 11 – Quality Control Plan**.

2.3.5 **Task 4** – Unexploded Ordnance Removal, Turn In of Inert Ordnance and Metallic Debris, and Perform Quality Control

2.3.5.1 FWENC shall furnish all necessary personnel and equipment to locate and perform a clearance of all UXO and inert ordnance in accordance with the SWWP and this Work Plan. Only USAESCH-approved UXO personnel shall perform UXO procedures in accordance with **DID OE-025, Personnel/Work Standards** and the **Interim Guidance Document 00-03, Basic Safety Concepts and Considerations for Ordnance and Explosives Operations**. All

access/excavation/detonation holes made during this task shall be back filled to grade at the conclusion of QC activities for that area.

2.3.5.2 **Target Reacquisition.** FWENC will provide equipment and personnel to reacquire the targets selected during Task 3. Suspected subsurface UXO locations (geophysical anomalies) will be presented as co-ordinate locations in the packages provided to the Target Reacquisition Teams. DGPS, USRADS, Robotic or Conventional Total Station, Vulcan Spatial Measurement System, measuring tapes or appropriate surveying techniques will be used to locate the X, Y co-ordinates of each anomaly. Each anomaly will be flagged with a numbered pin flag corresponding to the anomaly ID located at that position. Areas that could not be geophysically mapped will be clearly marked for further investigation in conjunction with guidance from the on-site USAESCH Safety Specialist where safety is an issue.

2.3.5.3 **Unexploded Ordnance Removal.** FWENC and its team sub-contractor USA Environmental will provide the necessary personnel and equipment in order to carry out the intrusive investigation of the selected targets. The Intrusive Teams shall be equipped with both hand tools and earth moving machinery (EMM) where required such as a mini-excavator or similar. Due to the depth and the nature of the terrain, gas powered hand tools such as the Atlas Copco Cobra Mk. 1 Breaker or similar may be used where slopes preclude the use of EMM. EMM operations shall be conducted within the guidelines of EM 385-1-1 and 29 CFR 1926 Subpart P. In the instance where anomalies are located underneath tree stumps, manual and mechanical excavation methods will be utilized to dig down beside the anomaly and then access will be gained from the side. Mechanical excavation will not be used closer than 12 inches to an anomaly. Although not expected, in instances where target sized anomalies are found to be ingrown within a tree stump, consultation with the on-site USAESCH Safety Specialist will be carried out to ascertain the most appropriate access method.

2.3.5.4 **Disposition of UXO and Inert Ordnance.** All recovered UXO shall be disposed of daily in accordance with **TM 60A-1-1-31, General Information for EOD Disposal Procedures** unless an exception is approved by the on-site USAESCH Safety Specialist. As outlined in **Chapter 3 - Explosives Management Plan**, FWENC shall provide demolition materials for disposal of OE in accordance with USAESCH DID **OE-005-03**. These shall be stored in the Ammunition Supply Point (ASP) at Fort McClellan or approved storage location. Arrangements will be made with Quality Assurance Specialist Ammunition Surveillance (QASAS) and the on-site USAESCH Safety Specialist prior to shipment of explosives. Inert ordnance items shall be vented in accordance with the provisions of **DoD 4160.21-M-1, Defense Demilitarization Manual**. Two weeks after the completion of fieldwork, FWENC will provide the Contracting Officer with an Ordnance Filler Report in accordance with USAESCH DID **OE-090, Ordnance Filler Report** to assess possible damage to environmental media.

2.3.5.5 **Accounting for UXO Items/Components Found.** FWENC shall maintain as part of its database, a detailed accounting of all UXO items/components encountered on the project site. This accounting shall include the amounts of UXO, identification, condition, depth located, disposition, location/mapping, and exposure data. This shall be contained in the removal report.

2.3.5.6 **Turn in of Inert Ordnance and Metallic Debris.** FWENC shall furnish all necessary personnel and equipment to turn in all recovered inert ordnance items and metallic debris in accordance with **DoD 4160.21-M, Defense Demilitarization Manual**. The methodology to accomplish this task is contained in **Section 2.9, OE and Non-OE Scrap Procedures** in the **SWWP**.

2.3.5.7 **Perform Quality Control.** Quality Control will be conducted on both processes and products within the Task Order in accordance with USAESCH DID **OE-005-11**. The basis of the Quality Control Plan is a three-phase control process consisting of preparatory, initial, and follow-up inspection/audits to ensure processes are in control and opportunities for improving processes are captured and implemented. Further detail on Quality Control is contained within **Chapter 11 – Quality Control Plan**.

2.3.6 **Task 5** – Prepare and Submit Site Specific Removal Report

2.3.6.1 In accordance with the Statement of Work, three weeks after completion of all field work, a Draft Removal Report will be submitted to USAESCH. One week after the receipt of USAESCH comments on this document, the Draft Final Removal Report will be submitted to DDESB and FMC. The Final Removal Report shall be submitted a further week after comments on the Draft Final Removal Report have been received.

2.3.6.2 USAESCH has requested that FWENC provide all anomaly maps and photos on CD-ROM for the Draft, Draft Final and Final Removal Reports. Only the Final Removal Report shall have four copies with both hardcopy and electronic versions of anomaly maps and photos.

2.3.7 Task 6 through 11 – Additional 40.7 Acre Extension

2.3.7.1 Tasks 6 through 11 are similar in scope to Tasks 1 through 5.

2.3.8 **Task 12** – Prepare Work Plan and Safety Plan Changes

2.3.9 **Task 13** – Location Surveys and Mapping

2.3.9.1 This task is similar in scope and conduct to Task 2 and consists of three sub-tasks:

a. Establishment of local control points.
b. Setout of intrusive excavation area boundaries.
c. Re-establishment of grid system.

2.3.9.2 Conduct initial topographical survey (quantity determination) with subsequent topographical surveys within the boundary on a weekly basis in order to provide progress indices. This shall be carried out by a Registered Land Surveyor licensed in the State of Alabama with a UXO escort. Initial confirmatory geophysical mapping conducted over approximately twenty grids, with the results serving to identify/confirm excavation areas. **Figure 2.1** is provided to show the approximate location of the Mechanical Removal Area.

2.3.10 **Task 14** – Prepare Final Amendment to Explosives Safety Submission

2.3.11 **Task 15** – Vegetation Removal and Disposal – 4 acres

2.3.11.1 The trees within the existing Rocket City area shall be removed utilizing an armored excavator with a standard bucket and armored thumb attachment. An 1181-foot exclusion zone shall be established during any operations within the contaminated area. The trees and stumps shall be segregated to a clear location outside the contaminated area where a UXO Technician will check them for metallic content once the mechanical excavation has stopped.

2.3.11.2 In the unlikely instance that a tree/stump displays non visible metallic content, it shall be further segregated and separately disposed of in an appropriate manner depending on the characteristics of the metal content. Trees or stumps are not expected to contain any ordnance items. Any visible OE items will be disposed of utilizing appropriate demolition procedures and exclusion zones.

2.3.11.3 The cleared tree debris shall be moved to a previously cleared portion of the Eastern Bypass per agreement with the FMC TF and the USAESCH.

2.3.12 **Task 16A** - Perform Mechanical Excavation and Separation - 15,000 Cubic Yards

2.3.12.1 This task involves processing 15,000 bank cubic yards of soil, heavily contaminated with ordnance and scrap, within selected areas of the Eastern Bypass right-of-way vicinity. An armored mechanical processing approach has been selected as the most cost-effective solution.

2.3.12.2 **Site Preparatory Work.** This phase consists of the following:

2.3.12.2.1 Haul Road Establishment/Upgrade. The haul road will be upgraded / improved as required, to safely accommodate the haul vehicles planned for this task. The removal of several trees and local widening and realignment of an existing dirt track shall be carried out utilizing the services of a general contractor. Any part of the established track not previously cleared shall be checked for anomalies prior to the start of work, utilizing a construction support protocol used during the existing clearance within the right-of-way. An appropriate UXO escort shall be provided as required per past construction support work in the area.

2.3.12.2.2 Processing Pad Construction. The footprint of the processing area has been determined to fit within an approximate 300' x 400' area, in the vicinity of the cleared M sector to the east of Rocket City. This area has been cleared to depth and is not considered a UXO contaminated area. A general contractor along with FWENC resources shall grade and compact the footprint, establish/upgrade suitable drains and erosion control devices and lay a coarse bituminous or rock layer. This layer is required in order to provide an adequate working surface and layer of separation between existing cleared grids and the excavated contaminated soil being processed. An 8-foot gated security fence shall be installed in order to restrict access to the area when work is not underway.

2.3.12.3 **Soil Processing.** In accordance with Scope of Work, the soil shall be removed from the selected areas and processed to eliminate UXO/OE and metal scrap larger than 1.25" x 2.0". This will be accomplished by using the steps detailed in the following paragraphs. The cleared excavation area shall be back-filled with the processed soil. This phase is comprised of the following operations:

2.3.12.3.1 Excavation, Loading and Hauling Machinery. Several machines will be supplied to excavate/haul/load the contaminated soil during this task. All machines utilized in the vicinity of contaminated soil are armored to specifications as directed by Dr. Michelle Crull (USAESCH) and the Explosives Safety Submission, which includes a minimum 9/16in armor and 2.311in ballistic glass. The machines consist of:

- One (1) Hydraulic Excavator – armored
- Two (2) Articulated Off-Road Dump Trucks – armored
- One (1) Wheeled Front-End Loader – armored
- One (1) Light Front End Loader/Integrated Tool carrier – armored
- One (1) Dozer – unarmored

2.3.12.3.1.1 The dozer will not be armored and will be utilized for manipulation and back filling of the clean fill post-processing soil. This machine will not be in operation when the mechanical excavation process is operating.

2.3.12.3.2 Operation of Excavation, Loading and Hauling Machinery. Foster Wheeler Environmental will provide personnel familiar with and qualified to operate the specific machinery. The machines will operate as follows:

- An armored Excavator will systematically excavate soil within the designated areas and load into the armored dump trucks.
- The armored dump trucks shall transport the soil from the excavation area to the processing area. An appropriate amount of freeboard shall be observed in the trays of the dump trucks to ensure contaminated soil does not fall off during transport to the processing area.

- An armored, wheeled front-end loader shall be used to maintain the soil piles and load the PowerGrid 1200. The armored, wheeled front-end loader shall also maintain scrap piles and load the metal shredder as required during Task 17.

2.3.12.3.3 Operation of Sifting Equipment and Metal Separating Magnets. Equipment shall be supplied and operated to sift the raw contaminated soil into three process streams. **Figure 2.2** is included to show the approximate location and lay out of the Mechanical Processing Area. To date, no ordnance items have been discovered that could be caused to detonate by the electromagnets. Jamming or clogging of the machinery will be assumed to be UXO related until proven otherwise. In the event a jam occurs, the Control Booth Operator will stop all operations and will direct all equipment operators to remain in their equipment. The Control Booth Operator and one other UXO technician will investigate the jam. The operator will notify the USACE Safety Representative and SUXOS, and together they will determine the best method to safely remove the jam. Minimum personnel will be allowed on site outside of armored equipment during the clearing of jam. For sifting and separation operations the following equipment shall be used:

- A PowerGrid 1200 with approximately three-inch bars above the hopper. The first process stream (PS1) sloughing off these bars shall be approximately three inches or greater and will pass along a raised conveyor that has a metal separating electromagnet incorporated into its top roller. The purpose of the electromagnet is to separate ferrous objects from the soil into an adjacent hopper, which shall be at the end of the conveyor. Depending on the composition of this process stream, the soil (minus all UXO and OE scrap larger than 3.0") will be back filled to the excavation site, after being checked. Alternative actions include recycling this process stream back through the PowerGrid 1200. This decision shall be made when the characteristics of this process stream can be clearly ascertained. The soil passing through the three-inch bars will proceed by conveyor to the loading hopper of the Trommel 830.

- A Trommel 830 shall be provided and operated to separate the incoming process stream of three inches or less into two process streams (PS2 and PS3). The process stream (PS2) of approximately 1" to 3" shall pass out the end of the Trommel 830 onto a raised conveyor. An electromagnet is incorporated into the PS2 conveyor to separate ferrous and non-ferrous materials. Once characteristics are known, as indicated in the previous paragraph, PS2 shall be dealt with further. The other process stream (PS3) shall consist of material less than 1" and will again pass through a raised conveyor incorporating an electromagnet. PS3 will be appropriately handled once actual characteristics are apparent.

- Observation Booth Provision and Operation. An air-conditioned booth, armored to the same specifications as the machines, will be provided in the work area in an elevated position for observation and control of the operation. The control booth will be a minimum 100ft from the screening/sifting operations, which is the minimum calculated K24 distance. All personnel will be in radio contact with the booth operator at all times. Operators will stay inside their machines until given direct verbal permission by the safety observer to disembark. Personnel not inside an armored vehicle or structure are not authorized within the designated exclusion zone. The booth will also incorporate a closed circuit television system (CCTV) utilizing multiple protected cameras for visual coverage of the area including the PowerGrid 1200 and the Trommel 830.

2.3.12.4 It is anticipated that contaminated soil processing will be conducted approximately five days per week. Exclusion zones will be enforced during all activities involving possible contact with ordnance. A sixth day of work shall be utilized in part for quality control inspections of the excavation area, backfill of clean soil, topographical quantity determination surveys and geophysical mapping. Exclusion zones will not be enforced during these operations as no intrusive work is programmed.

2.3.13 **Task 16B** - Perform Mechanical Excavation and Separation - For Each Additional 5,000CY.

2.3.13.1 The scope of this task is identical to Task 16A, except it is priced in 5000 CY lots.

2.3.14 **Task 17** - Perform Demolition, Demilitarization AEDA/Range Management.

2.3.14.1 This task involves demolition and demilitarization of Process Stream 4 (PS4), made up of UXO/OE and metal scrap from the other process streams (PS1, PS2 and PS3). This material will be removed from the mechanical separation site and delivered to the Shredder/Disposal Area via armored equipment. Once the UXO/OE metal scrap is delivered it will be spread out with an armored, wheeled front-end loader and inspected. All scrap will be removed and all UXO/OE will have demolition performed in accordance with Eastern Bypass ESS Amendment 1. Once the UXO/OE items have been vented or demolished as needed the remaining scrap will be inspected and sent to the shredder. A Low-Speed, High-Torque Metal Shredder from American Pulverizer will be utilized as Government Supplied Equipment to shred the metal scrap. The demilitarized process stream (PS5) resulting from this operation shall be loaded into roll off containers and disposed of at the direction of Contracting Officer. **Figure 2.3** is included to show the approximate location and layout of the Shredder/Disposal Area.

2.3.14.2 The material to be shredded will be loaded into an armored dump truck or front-end loader and transported to the Shredder/Disposal Area. The armored

equipment will load the shredder with material from the previously inspected pile of metal scrap. An armored control booth shall be provided for observation of the demolition and shredding operations. All access to the shredder / disposal area will be approved via radio link prior to entering the exclusion zone. Personnel will not be authorized inside the exclusion zone unless they are within an armored structure or conveyance during demolition operations. The control booth will be a minimum 100ft from the shredder and disposal operations, which is the minimum calculated K24 distance.

2.3.15 **Task 18** – Perform Quality Control.

2.3.15.1 This task involves conducting quality control on all parts of the task. The objective is:

- To ensure the project is running as planned
- Ensure that the excavation is deep enough to remove all anomalies
- Ensure that all anomalies are properly processed through the system
- Ensure the backfill material is clean and fit for purpose.

2.3.15.2 QC of Back-fill Material. The components of the process streams considered free of all UXO and OE scrap larger than 1" shall have periodic checks made by both Foster Wheeler Environmental QC personnel and USAESCH Safety Specialists before backfill. Material that passes through the 1" screens should not contain any ordnance items, although small pieces of metal and other ferrous scrap are acceptable. It must be noted that the soil in the area contains a large proportion of rocks with a high magnetic influence (hot rocks) and a positive indication on a detector does not always indicate the presence of metallic items.

2.3.15.3 Verification of Sufficient Excavation Depth. FWENC QC personnel shall be tasked with checking each part of the excavation to ensure the depth is sufficient to remove all indication of UXO/OE larger than 1.25" x 2.0". The initial check shall be carried out with handheld instruments such as the White's Spectrum XLT, Vallon VMX2, Schonstedt, Magnatrac or equivalent.

2.3.15.4 Once the section of ground has passed this instrument check, it shall be geophysically mapped and analyzed to ensure that it is free from target size anomalies. If target size anomalies are located a intrusive team will investigate individual anomalies or the excavator will remove additional spoils. Following this action the FWENC UXOQCS will perform his final QC check and turn the grid over to government QA. Immediately upon successful completion of the QC investigation the USAESCH QA inspector will complete his inspection on the designated grid so as not to delay the backfill operations or further excavation operations.

2.3.16 **Task 19** – Removal Report.

2.3.16.1 Continuation of the scope of Task 5 – Removal Report.

2.3.17 **Task 20** - Equipment Repair Due to Explosive Damage and/or UXO Clearance Work, In Support of Task 16 Work.

2.3.17.1 This task allows for UXO Clearance work delays resulting from explosive damage or clogged machines.

Grid Sizes and Layout

2.3.18.1 The grid size that will be utilized on this Task Order is 100' X 100' plan view.

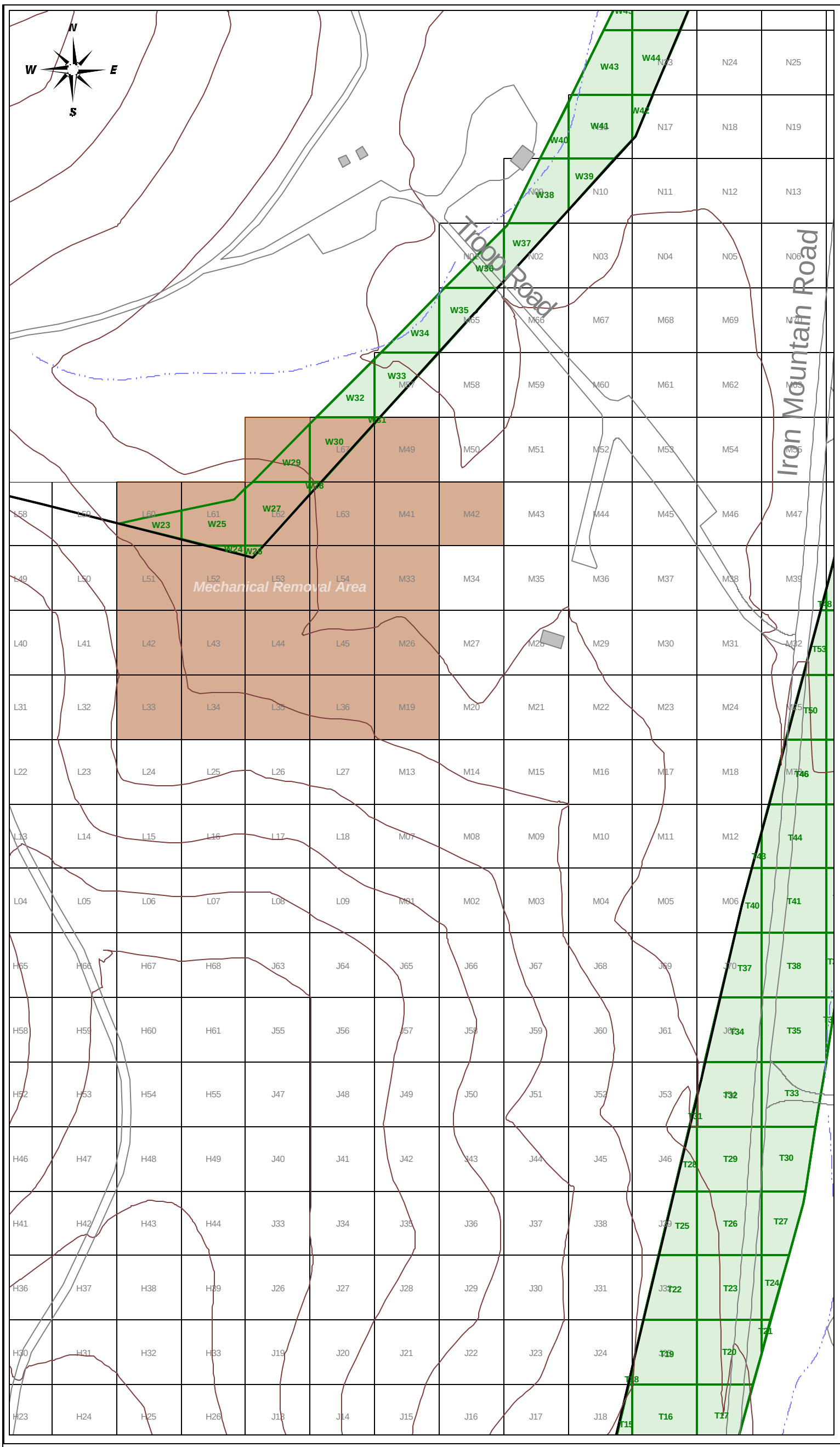
2.4 PERSONNEL

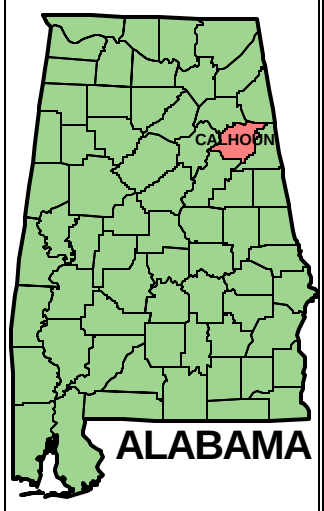
2.4.1 UXO Personnel and Qualifications

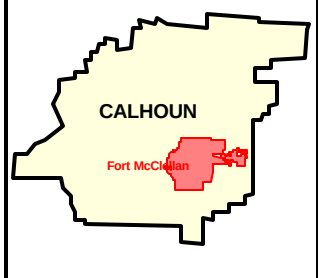
2.4.1.1 All individuals executing UXO procedures or UXO-related procedures will be qualified UXO personnel and meet or exceed the USAESCH DID **OE 025, Personnel/Work Standards**. These personnel will be US citizens who have graduated from the US Army Bomb Disposal School, Aberdeen, Maryland, or the US Naval Explosive Ordnance Disposal (EOD) School, Indian Head, Maryland or an approved UXO training facility. UXO personnel resumes and appropriate training certificates will be provided to USAESCH for approval prior to field tasks commencing.

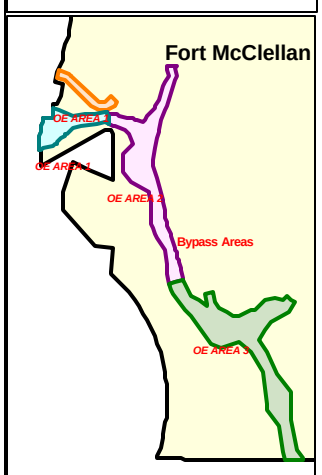
2.4.2 Key Personnel Responsibilities

2.4.2.1 The procedures outlined within this Work Plan shall be followed by the Foster Wheeler Environmental field team. The UXO team will consist of qualified Senior UXO Supervisors and UXO Technicians approved by USAESCH. Qualification certificates are maintained on file at the corporate office and will also be maintained on-site in the office trailer. An organizational chart is contained as **Figure 2.3 – Eastern Bypass OE Removal Management Team**. The key personnel in this Task Order are:









LEGEND

- Bypass ROW
- Bypass Extension Area
- Bypass Extension Grids
- Proposed Mechanical Removal Areas

Contour interval 25 Ft

0 50 100 150 200 250 ft

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Figure 2.1
Mechanical Removal Area

Fort McClellan, Calhoun County
Anniston, Alabama
October 2002

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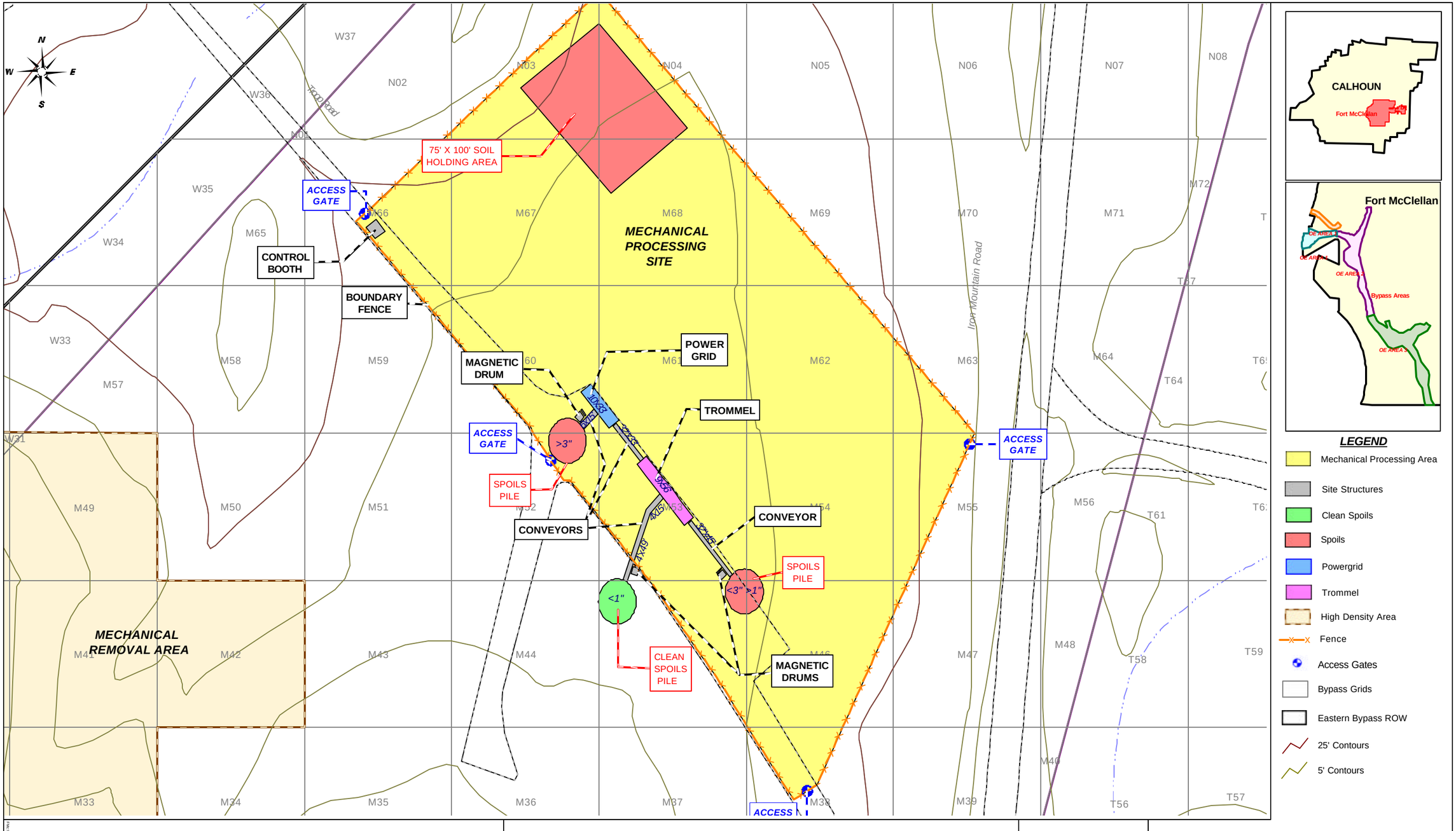


FOSTER WHEELER ENVIRONMENTAL CORPORATION

Fort McClellan, Calhoun County, Anniston, Alabama

October 2002

Figure 2.2

Mechanical Processing Area Within the Eastern Bypass

INSPECTION/DEMOLITION AREA

CONCRETE BLOCK PROTECTIVE WALLS

SHREDDER

CONVEYOR

ACCESS GATE

SHREDDED SCRAP

CONTROL BOOTH

ACCESS GATE

INSPECTED SCRAP PILE

GENERATOR/ HYDRAULIC UNIT

PROCESS SCRAP STORAGE CONTAINERS

E49 E50 E35 E36 E23 E24 E37

R57 R58 R59 R53 R54 R55 R50 R51

N W E S

CALHOUN

Fort McClellan

Fort McClellan

OE AREA 4

OE AREA 1

OE AREA 2

Bypass Areas

OE AREA 3

LEGEND

- Shredder /Disposal Area
- Site Equipment
- Inspected Scrap Pile
- Shredded Scrap
- Fence
- Access Gates
- Bypass Grids
- Eastern Bypass ROW
- 25' Contours
- 5' Contours

0 15 30 45 60 75 ft

Contour interval 5 Ft

FOSTER WHEELER ENVIRONMENTAL CORPORATION

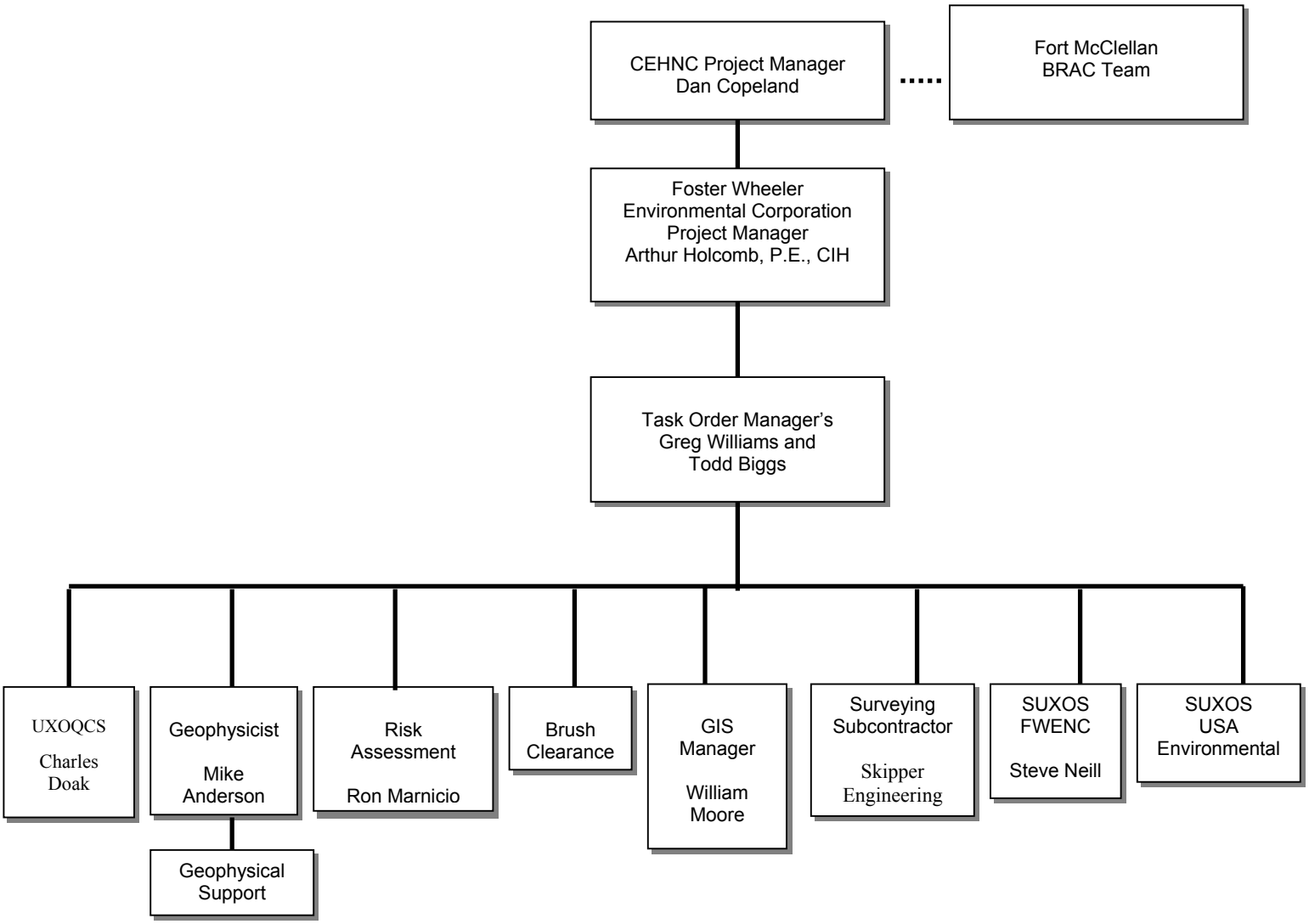
Fort McClellan, Calhoun County, Anniston, Alabama

October 2002

Figure 2.3

Shredder/Disposal Area Within the Eastern Bypass

Figure 2.4
Eastern Bypass OE Removal
Management Team



2.4.2.2 **Project Manager.** The site wide Project Manager is Mr. Art Holcomb, PE, CIH (see Appendix E for resume). His responsibilities are detailed in **Section 2.2.1 – SWWP**.

2.4.2.3 **Task Order Manager.** The Task Order Manager is Mr. Greg Williams (see Appendix E for resume). His responsibilities include: co-ordination with the Foster Wheeler Project Manager in developing project scope and costs, detailed work order specifications and schedules and identification of project personnel to be utilized in accomplishing the Statement of Work. Procurement and management of subcontractors is also the responsibility of the TO Manager. The TO Manager is responsible for the completion of all major deliverables. The TO Manager will also approve charges by field and office personnel, compare ongoing project cost and schedule performance to the baseline cost/schedule, and bring any significant variance to the attention of the Foster Wheeler PM, who will communicate impacts to the USAESCH PM as necessary. The TO Manager will identify if a change in scope is necessary to meet technical requirements, and will discuss potential changes in scope with the Foster Wheeler PM, and with the USAESCH PM as necessary. For the Mechanical Removal portion of this Task Order, Mr. Todd Biggs is the Task Order Manager and his duties and responsibilities remain the same as stated above for this portion of the Task Order.

2.4.2.4 **Senior UXO Supervisors (SUXOS).** Due to the number of UXO Technician III exceeding ten personnel on this task, a need for an additional SUXOS has been identified. The Eastern Bypass SUXOS shall report to and assist the SUXOS in the function of his responsibilities relating to this Task Order. Responsibilities are detailed in **Section 2.2.1 – SWWP**.

2.4.2.5 **UXO Safety Officers (UXOSO).** The UXOSO for the site is Mr. Nathaniel Martin (see Appendix E for resume). Responsibilities are detailed in **Section 2.2.1 – SWWP**. In addition, due to the number of teams and their locations, the need for a second UXOSO has been identified from the commencement of Task 3 to the cessation of Task 4.

2.4.3 Composition of Teams

2.4.3.1 The following is the composition of the teams involved in the Task Order. Team composition will in all cases be in accordance with USAESCH DID **OE-025, Personnel/Work Standards**. All UXO Technician III will report directly to the Eastern Bypass SUXOS.

2.4.3.2 **Site Preparation Team.** This team will monitor and provide liaison for brush removal operations. The Team Leader will be a UXO Technician III, with one UXO Technician II or I as required to monitor and provide liaison to brush removal personnel and machinery from sub-contractor(s) depending on the final composition of the brush removal work force. In accordance with USAESCH guidance, a single team has been programmed during the conduct of this Task Order.

2.4.3.3 **Grid Setout/Reacquisition Teams.** This team will utilize DGPS, Total Station or other precision surveying methods to setout the 100' x 100' grid corners, reacquire and mark selected targets and delineate areas within a grid that were not geophysically mapped and require further investigation. The Team Leader will be a UXO Technician III, with one UXO Technician II or I as required. Two teams have been programmed during the conduct of this Task Order.

2.4.3.4 **Geophysical Mapping Teams.** These teams will primarily utilize the EM-61 with positional data supplied by USRADS, DGPS, Vulcan Spatial Measurement System or Robotic Total Station. The teams will each consist of a suitably trained UXO Technician III and two UXO Technician II or I. A field Geophysicist will be on-site associated with these teams. Three Geophysical Mapping Teams have been programmed for this Task Order.

2.4.3.5 **Intrusive Teams.** These teams will intrusively investigate the anomalies indicated by the target selection process. Conventional UXO investigation will also be carried out by these teams where required. Each team shall consist of a UXO Technician III and up to six UXO Technician II or I. They shall be equipped with standard equipment with the addition of a mini excavator and/or gas powered hand tools (Atlas Copco Cobra Breaker Mk1 or similar). Five Intrusive Teams have been programmed during the conduct of this Task Order.

2.4.3.6 **Quality Control Teams.** The Quality Control Team will in the first instance be supervised and tasked by the site UXOQCS. Each team will consist of a UXO Technician III and a UXO Technician II or I. Three Quality Control Teams have been programmed during the conduct of this Task Order. The teams shall be tasked with extensive process and product QC.

2.4.3.7 Mechanical Clearance Demolition Team. For the purpose of the mechanical clearance demolition, a demolition procedure has been designed which will allow the safest and most efficient use of personnel. It is expected that demolition operations will be a daily, ongoing activity that will require maximum flexibility in order to keep the operation safe while maintaining a satisfactory production rate. The team is composed of the following personnel:

a. (1) UXO Technician III, Team Leader
b. (1) UXO Technician II, Team Member
c. (1) UXO Safety Officer

This procedure is explained in Amendment 1, Explosive Safety Submission for the Eastern Bypass.

2.5 MOBILIZATION PLAN

2.5.1 FWENC is already established on the site with field office and storage facilities. Further project specific personnel and equipment will be mobilized in accordance with the **SWWP – Section 2.3 - Mobilization Plan**. For this Task

Order, two portable site trailers will be mobilized for the duration of the Task Order.

2.6 SITE PREPARATION ACTIVITIES

2.6.1 Upon completion of mobilization activities, Foster Wheeler Environmental will commence site preparation. Site preparation activities will be performed as described in **SWWP – Section 2.4 - Site Preparation Activities** and below.

2.6.2 Brush Clearance

2.6.2.1 The Eastern Bypass is heavily vegetated with trees, bushes, vines, and kudzu plants. As a precursor to this Removal Action, a contract to remove marketable trees within the Eastern Bypass boundaries is currently being administered by the Mobile District Corps of Engineers. It is expected that an indeterminate amount of debris and unmarketable trees will remain in the area and will need to be cleared and reduced during the Site Preparation phase of this Task Order.

2.6.2.2 In order to enable unimpeded access for the geophysical mapping crews, the complete area will be cleared of vegetation as close as possible to the ground surface without becoming an intrusive activity (note that tree stumps at or around 4 inches present a trip hazard). Clearing will be performed in accordance with **Chapter 12 - Environmental Protection Plan**.

2.6.2.3 It is proposed to use several different methods to accomplish the brush clearance task in this Task Order. The marketable tree removal carried out prior to the start of the Task Order will leave an indeterminate amount of unmarketable trees and debris. Taking this and the widely varying slopes, terrain and tree/brush density, a combination of high capacity chippers, tree shears, bush-hog type vehicles and excavator mounted tree chipper will be utilized in accordance with industry standard brush clearance practices. In accordance with USAESCH guidance, a single escort team consisting of a UXO Technician III and a UXO Technician II will provide roving monitoring and liaison between the sub-contract brush clearance crews.

2.6.2.4 A UXO Technician III will act as Site Preparation Team Leader and will report directly to the Eastern Bypass SUXOS. Any OE encountered during Site Preparation will be marked with pin flags and reported to the Eastern Bypass SUXOS. Note that a 12 inch clearance of UXO has been carried out over the majority of the area by EODT – the areas not cleared by EODT will not be entered by the brush sub-contractor mechanical equipment until they have been cleared of OE to at least 12 inches below grade. Manual brush clearance may be carried out after a surface clearance. Prior to reporting to the Eastern Bypass SUXOS, the Site Preparation UXO Technician III will make a preliminary assessment of the item and determine the necessity of evacuating the brush clearing crew. The item will be disposed of immediately or at the end of the day's

operation in accordance with the disposal procedures referenced in **Section 2.6.5** of this Chapter.

2.6.3 Location Surveys

2.6.3.1 FWENC will sub-contract out the boundary delineation/confirmation and self-perform the grid setout and anomaly reacquisition using teams of two UXO Technicians. At all points where wooden stakes or posts are to be driven into the soil or where survey corners are to be located, a magnetometer check of that point will be accomplished prior to their emplacement. If at any time the magnetometer indicates a positive reading, another location free of anomalies shall be selected for placement of the marker. Survey and boundary stake installation are the only intrusive activities (subsurface) authorized during Location Activities.

2.6.4 Statistical Sampling Procedures

2.6.4.1 The only statistical sampling procedures in this Task Order will be concerning Quality Control and are detailed in **Chapter 11 - Quality Control**.

2.6.5 OE Operations

2.6.5.1 Detailed procedures for reporting and disposition of UXO, including responsibilities of personnel, overall safety precautions, UXO identification, transportation, safe holding areas, operations in populated/sensitive areas, and all demolition and post demolition operations and any required engineering controls for intrusive operations and intentional detonations are contained in **Attachment 2.1- SWWP**.

2.6.5.2 Detailed procedures for managing, reporting, venting, and disposing of OE scrap and non-OE scrap are contained in **Section 2.9 - SWWP**.

2.7 DATA MANAGEMENT

2.7.1 In order to reduce the volume of paperwork utilized in the Task Order, and consequently, reduce the size of the Removal Report, field data collection devices will be used by each team. This gives the advantage of providing data in both electronic and hardcopy as required with minimal post-processing. The UXO Data Specialist and Database Manager will be responsible for direct data management within this Task Order. The following protocols will be used in each work phase:

a. **Boundary Delineation.** Electronic field log book;

b. **Brush Clearance.** Electronic field log book;

c. **Grid Setout.** Electronic field logbook and grid corner locations on flash card for use in DGPS hardware;

d. **Geophysical Mapping.** Electronic field log book and geophysical data on flash cards for processing by geophysicists;

e. **Geophysical Analysis.** The data will be transferred from the flash cards and processed using the procedures explained in **Chapter 5**. This data will be returned to the GIS Manager electronically for the production of dig sheets. The GIS Manager will produce data in both hardcopy summary and electronic form for use by the reacquisition hardware;

f. **Reacquisition.** Electronic field log book and anomaly locations on flash card for use with reacquisition hardware;

g. **OE Removal.** Electronic field log book and details of anomalies on flash card for QC and geophysical prove out; and

h. **Quality Control.** Electronic field log book and details of all process and product QC.

2.8 DATA BACKUP

2.8.1 Data will be backed up each day by the Database Manager. 8mm tape drives connected to the existing FWENC network will be utilized to backup data. CD-RW drives will also be used where applicable.

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3.0 EXPLOSIVES MANAGEMENT PLAN

3.1 GENERAL

3.1.1 See **Section 3.0 - Explosives Management Plan** of the SWWP. An Explosives Management Plan was prepared in accordance with USAESCH **DID OE-005-03, Explosives Management Plan**, Federal Acquisition Regulation (FAR) 45.5, ATFP 5400.7, DoD 6055.9-STD, Army Regulation (AR) 190-11, DOT Regulations, and Alabama Explosive Safety Act of 1993.

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4.0 EXPLOSIVES SITING PLAN

4.1 4.1 GENERAL

4.1.1 An Explosives Siting Plan was prepared in accordance with USAESCH DID **OE-005-4, Explosives Siting Plan**. See **Section 4 - Explosives Siting Plan**, in the SWWP. **Figure 4-1, Q-D Arcs and Planned Demolition Areas** shows the location of planned OE operations within this Task Order and Quantity-Distance (QD) arcs for safe separation distances.

4.1.2 The Most Probable Munition (MPM) selected by Dr. Michelle Crull for this OE Removal is the Projectile, 37mm Mk. II. This item of ordnance has an exclusion zone radius calculated by USAESCH of 1181 feet (~388 meters). Note that the 37mm projectiles found in OOU2 were the 37mm M-51 AP-T and 37mm Mk. 1 LE but the 37mm Mk. II was selected due to its HE content and higher risk. This item was selected as the most appropriate after review of items found by EODT and consultation and discussion with the on-site USAESCH Safety Specialist.

4.1.3 The 1181-foot exclusion crosses the property boundary at the western side of the Eastern Bypass OE Removal Area into uninhabited property, see **Figure 4.1**. During the previous removal action conducted by EODT, the 1 in 600 ft^2 rule was invoked by USAESCH and a 100-foot exclusion zone was utilized in this area without incident. A 1 in 600 ft^2 rule will be requested from USAESCH in identical fashion to that granted to EODT for their clearance in the same area. After discussion with the on-site USAESCH Safety Specialist, unless granted earlier based on the EODT precedent, this exclusion zone shall be requested once sub-surface conditions in the area have been established during the investigation. This 100-foot exclusion zone does not cross the property boundary.

4.1.4 For the mechanical removal an 1181-foot exclusion zone applies. This EZ does not fall outside the EZ established for the base EBP ROW. **Figure 4.1** is provided to show the EZ for the Mechanical Removal Area, Mechanical Processing Area, and Shredder/Disposal Area.

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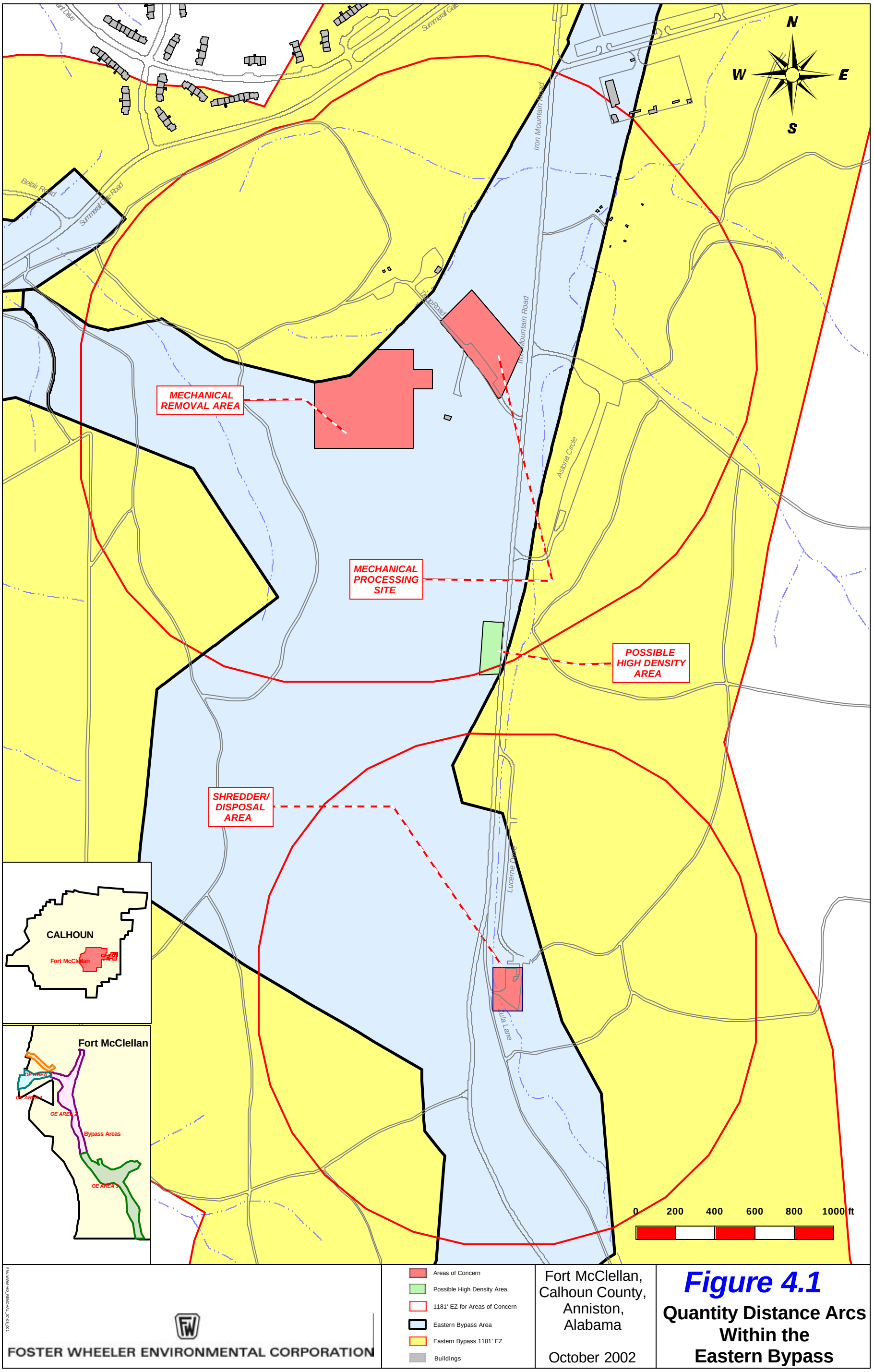

N
W
E
S
MECHANICAL REMOVAL AREA
MECHANICAL PROCESSING SITE
SHREDDER/ DISPOSAL AREA
POSSIBLE HIGH DENSITY AREA
Iron Mountain Road
Summeral Gate Road
Belair Road
Summeral Gate Road
Tiger Road
Astoria Circle
Lucerne Drive
Ursula Lane
CALHOUN
Fort McClellan
Fort McClellan
OE AREA 1
OE AREA 2
OE AREA 3
Bypass Areas
0 200 400 600 800 1000 ft
Areas of Concern
Possible High Density Area
1181' EZ for Areas of Concern
Eastern Bypass Area
Eastern Bypass 1181' EZ
Buildings
FOSTER WHEELER ENVIRONMENTAL CORPORATION
Fort McClellan, Calhoun County, Anniston, Alabama
October 2002
Figure 4.1
Quantity Distance Arcs Within the Eastern Bypass

4.2

5.0 GEOPHYSICAL MANAGEMENT PLAN

5.1 GENERAL

5.1.1 All geophysical investigations shall be supervised by a geophysicist meeting the qualification requirements listed in USAESCH **DID OE-025, Personnel/Work Standards**. During the geophysical investigation of this Task Order, a geophysicist will be on-site during data acquisition operations.

5.2 SITE DESCRIPTION

5.2.1 Geophysical Investigation Program Objectives

5.2.1.1 A geophysical mapping survey will be performed over an agreed and budgeted 950 grids within the original Eastern Bypass OE Removal Area. Grids within the 40.7-acre extension shall be cleared with a combination of geophysics and mag and dig protocols. Due to the excessive slope and other factors in some areas, it is expected that a proportion of grids may not be effectively mapped with the proposed method (EM61, 0.5 or 1 meter coil and DGPS, Vulcan Spatial Measurement System, USRADS, or RTS). The objective of the geophysical investigation is to detect metallic objects and features (anomalies) equal to or larger than the size of a 37mm projectile that might be related to potential UXO contamination. These anomalies may represent a hazard for future activities planned for the site.

5.2.1.2 Based on the prove-out test performed at Fort McClellan in the summer of 1999, it is anticipated that the primary geophysical sensor technology that will be used to meet the program objectives is time domain electromagnetic (TDEM). Due to the irregular terrain and the lack of tall and dense vegetation (i.e., canopy), the most appropriate and effective positioning technology to utilize will be Differential Global Positioning Systems (DGPS). In areas where satellite availability is low such as steep gullies or close to the boundary tree line, Ultrasonic Ranging and Data System (USRADS) will be the most effective positioning system to employ. The use of Robotic Total Stations (RTS) to provide positioning for the EM61's are being considered and will be based on their successful demonstration during the test phase of the geophysical program.

5.2.1.3 The geophysical mapping methodology that will be employed is 100% mapping over all possible 100' x 100' grids setout in State Plane Coordinates. Although the grid size of ¼ acre was selected to simplify data tracking procedures, individual geophysical data acquisition sessions will be performed over areas ranging in size from 0.5 acres to 1 acre. This procedure will minimize the number of turnarounds at the end of each data acquisition line, which will increase the overall efficiency of the geophysical program.

5.2.2 Area of Investigation

5.2.2.1 The area of investigation is within the right of way boundaries of the Eastern Bypass. The terrain ranges from mild slopes in the upper northern areas to steeply sloped in the central and southern areas. Currently a marketable tree removal is being carried out for Fort McClellan Transition Force Headquarters (TFHQ) by logging contractors. During Task 2 of this Task Order, the remainder of the unmarketable trees and debris will be removed in order to provide an unimpeded area for geophysical investigation.

5.2.2.2 **Anticipated UXO Type, Composition, and Quantity.** The types of ordnance that may be present in the Eastern Bypass Removal Area are detailed in **Table 5.1 – Ordnance Types**. EODT carried out an intrusive clearance to 12 inches below grade over the majority of the grids and removed much of the expected ordnance. Notwithstanding this, it is generally accepted that significant amounts of OE remain in the impact areas of OOU2.

Table 5.1
Ordnance Types

Ordnance Item	Ordnance Item
3" Stokes Mortar, inert (Mk-1)	Grenade, flare, rifle, live (M-23)
2.36" rocket motor, inert (M-7)	Grenade, hand, practice (Mk-2)
2.36" rocket warhead, inert (M-7)	Grenade, hand, practice (Mk-2)
2.36" rocket warhead, heat (M-6)	Grenade, hand, live, BP, (Mk-2)
2.36" rocket, heat (M-6)	Grenade, rifle, smoke, inert (Mk-22)
2.36" rocket, inert (M-7)	Grenade, rifle, practice (M-11)
2.36" rocket, fuze, live (M-6)	Grenade, rifle, M-9A1, live
2.36" rocket, fuze, inert	Grenade, smoke, inert (M-18)
60mm mortar, HE (M-49)	Grenade, smoke, live (M-18)
60mm mortar, illum, inert (M-83)	Grenade, smoke, live (M8-HC)
60mm mortar, inert (M-50)	Mine, bounding, inert (M-2)
60mm mortar, inert (M-69)	Mine, practice, inert (M-12)
Flare, slap, inert	Projectile, 37mm, AP-T (M-51)
Flare, slap, live	Projectile, 37mm, LE, live (Mk-1)
Flare, trip, M-49, live	Projectile, 81mm, practice, (M-68)
Fuze, grenade, smoke, inert	Smoke, canister 105mm, inert (M-84)
Fuze, grenade, smoke, live	Booster, 3" stokes mortar
Firing Device, live, (M-3)	Primer, cartridge case, (projo), live

5.2.3 Anticipated Depth of UXO

5.2.3.1 The limit of the initial depth of investigation for this statement of work is four feet, though it is anticipated that most of the ordnance items found will be significantly shallower than four feet. A high proportion of the removal area consists of impact areas and significant amounts of OE are expected in the top three feet below grade. Note that although not expected, if there is an apparent anomaly at greater than four feet, this location will be marked and further consultation will be carried out with USAESCH before it is investigated. Further personnel and specialized equipment may be mobilized in order to cover any shoring or benching operations required to exploit these anomalies.

5.2.3.2 Foster Wheeler Environmental's methodology was developed for this task based on the U.S. Army Corps of Engineers' Publication **EM 1110-1-4009**, **Ordnance and Explosives Response Engineer Manual**, which covers typical detection depths of ordnance items using various geophysical instruments. In addition, a geophysical prove-out test was performed in the summer of 1999. The purpose was to demonstrate that the EM-61 TDEM sensor technology proposed can successfully detect the suspected ordnance types under the specific conditions encountered at the site. The prove-out also demonstrated that the geophysical system proposed will meet the requirements of the publication cited above.

5.2.4 Topography

See Section- 1.5 – Topography of this work plan.

5.2.5 Geologic Conditions

5.2.5.1 Fort McClellan is situated near the southern terminus of the Appalachian Mountain chain. All but the easternmost portion of the Main Post lie within the Valley and Ridge Province of the Appalachian Highlands. The portion of Fort McClellan west of Choccolocco Creek lies within the Piedmont Province. The age of the consolidated sedimentary and metamorphic rocks range from Precambrian to Pennsylvanian. On a large scale, most of the rocks have been intensely folded into an aggregate of northeast-southwest trending anticlines and synclines with associated thrust faults. The shallow geology in the area is characterized by colluvial deposits. **Table 5-1** in the approved General Site Wide Work Plan summarizes the major stratigraphic units underlying Fort McClellan. The presence of metamorphic rocks increases the potential for minerals such as magnetite and other associated magnetic minerals; it is important to utilize this information when planning and selecting sensors for geophysical surveys at Fort McClellan.

5.2.6 Soil Conditions

This information is reviewed in **Section 5.3.9** of the SWWP.

5.2.7 Shallow Groundwater Conditions

5.2.7.1 This information is discussed in **Section 5.3.11** of the SWWP.

5.2.8 Site Utilities

5.2.8.1 There are no known existing subsurface utilities in most of the areas that will be geophysically surveyed based on current information. There are utilities in the northern area adjacent to the buildings that are not expected to impede the geophysical survey activities. If utilities are identified during the geophysical data interpretation, they will be documented and annotated on color-coded maps and intrusive dig sheets. The rigorous nature of intrusive excavation for UXO further ensures that any utilities will not be inadvertently damaged.

5.2.9 Man-Made Features Potentially Affecting Geophysical Investigations

5.2.9.1 Man-made features such as above and below ground power lines, buildings/ foundations, storage tanks (above and below ground), fences, landfills/disposal areas, roads, and any other features that may influence the geophysical investigation will be documented and accompany the field data acquisition form with specific information on the location, extent, and nature of the feature.

5.2.10 Site-Specific Dynamic Events

5.2.10.1 This information is discussed in **Section 5.3.14** of the SWWP.

5.2.11 Overall Site Accessibility and Impediments

5.2.11.1 The Eastern Bypass Area of Fort McClellan contains paved, unpaved improved and dirt roads, as well as fire breaks and trails that will be used to access areas to collect data. Mapping Teams will be equipped with Kawasaki Mules or similar vehicles to transport their equipment. A proactive road maintenance program is planned to enhance mobility in the area.

5.2.12 Potential Worker Hazards

5.2.12.1 This information is reviewed in **Section 5.3.16** of the SWWP and **Chapter 6 – Site Safety and Health Plan.**

5.3 GEOPHYSICAL INVESTIGATION METHODS

5.3.1 Equipment

5.3.1.1 The EM-61 utilizes two coaxial receiver coils to measure the residual magnetic field generated by conductive and/or magnetic materials (i.e., non-ferrous and ferrous objects and features). The EM-61's proposed by Foster Wheeler Environmental are designed to measure the residual magnetic field at a time when the response from conductive and/or magnetic objects is maximized compared to the response from most earth materials. The use of two receiver coils also makes it possible to differentiate, in a simplistic fashion, shallow versus deeper objects. An additional benefit of the specific design of the EM-61 system is that it permits a more focused observation of the subsurface in areas of cultural interference, as well as areas characterized by a high spatial density of medium to large-size (e.g., 81mm, 155mm) subsurface objects. This is due to both the mechanical design and operational parameters of the instrument, as

well as the inherent nature of active EM fields, which diminish in magnitude at a much higher rate than other sensor technologies such as magnetometry.

5.3.1.2 The primary factors that affect the ability to detect objects or features with TDEM methods include volumetric size and orientation, distance from the sensor, the material properties contrast between the object or feature and the surrounding materials, and the magnitude of natural and manmade sources of "noise".

5.3.1.3 The EM-61 is relatively insensitive to nearby surface cultural interference such as buildings, power lines, and fences, and has the ability to record digital data at up to 18 hertz, which translates to a spatial sample density of approximately 0.15 feet along the ground surface.

5.3.2 Procedures

5.3.2.1 Each 100' x 100' geophysical survey sampling grid will be cleared of vegetation and other natural materials that may impede the data acquisition process, or significantly alter the resultant quality of data from the geophysical survey. After brush clearance, UXO personnel will perform a visual clearance of metal prior to geophysical data acquisition (EODT has already completed an intrusive clearance to 12" below grade over the majority of the area). After these activities are completed, the area will be surveyed with the EM-61 coupled to a DGPS, USRADS, Vulcan Spatial Measurement System or Robotic Total Station. Geophysical and position measurements will be digitally recorded and the raw data acquired in the field for each survey grid will be prepared for processing by the Site Geophysicist. This data will be processed, analyzed, and interpreted to prepare dig sheets for intrusive activities in conjunction with Home Office Geophysicist's in FWENC's Denver office.

5.3.2.2 Surveys performed with the EM-61 coupled to a DGPS system may be performed where the terrain and vegetation allow. A base station will be positioned on a known location point a maximum of 5-6 miles from the area being investigated. The GPS antenna will be positioned on a PVC frame directly above the central axis of the EM-61 coil. It is anticipated that the position data will be post-processed to provide the most accurate position solution, however, position data recorded in real time may also be utilized to determine the sensor location.

5.3.2.3 In areas near the tree line it may be necessary to utilize the USRADS for positioning of the EM61. To effectively use the USRADS positioning and data recording system, a minimum of three transponders will be located at positions with known relative coordinates. The remaining transponders will be positioned over the area with a geometry that enables the instrument location to be accurately determined. A minimum of one location will be occupied with a transponder where the coordinates are known, however, this x-y coordinate will not be entered as a fixed (i.e., known) point in the USRADS acquisition software. Locations such as these will be used in the field as QC checks of the relative accuracy of the position coordinates. The lateral x-y offset from the QC point will

be documented on the appropriate data acquisition form prior to surveying the grid. Transponders that are not located at points with known coordinates may have their location marked with PVC pin flag for future reference. A portable computer located near each survey grid will be used to record the EM-61 instrument data and coordinate position information. The intensity of the EM-61 measurements will be closely monitored to ensure the EM-61 data recording system is functioning properly.

5.3.2.4 It may prove advantageous to utilize Robotic Total Stations for positional data due to the increased efficiency and accuracy of the setup procedure when compared to USRADS. The instrument will be set up on a known point and will track a reflective prism situated directly above the central axis of the EM-61 coil. The use of this system will be based upon the results from the test phase of the geophysical program.

5.3.2.5 Although not anticipated, conventional modes of data acquisition and navigation may be necessary in some specific area to meet the project goals due to the irregular terrain. This method will employ a transit or RTS, tape measures, and non-metallic pin flags used as waypoints within a survey plot to accurately locate the sensor system. Geophysical data acquisition will be initiated at a marked corner of the survey plot and proceed along parallel data acquisition lines. Fiducials (i.e. event markers) will be recorded concurrently with the digital EM-61 data at locations corresponding to survey flags (i.e. waypoints) placed along pre-marked data acquisition lines.

5.3.3 Personnel

5.3.3.1 The geophysical staff will consist of a Home Office Geophysicist, a Field Geophysicist and a Site Geophysicist. Three geophysical survey crews will be used to acquire data. Each acquisition team will consist of one UXO Technician III and two UXO Technician II.

5.3.3.2 The Field Geophysicist will work with the Mapping Teams to ensure the production rates are met and the data quality, especially during field data acquisition activities, is adequate to meet the program objectives. The Home Office Geophysicist will be responsible for the overall quality of the geophysical program, and will provide guidance to the Site and Field Geophysicist in the processing and interpretation of the data. All Geophysicists involved will process and interpret the geophysical data as well as provide field QC oversight for the data acquisition and specific intrusive investigation processes, including target reacquisition and comparison of excavation results with the interpreted geophysical characteristics.

5.3.3.3 The Mapping Teams will be responsible for collecting data and providing this data to the Site GIS Manager and Site Geophysicist on a daily basis. All geophysical data will be supplied to the data manager or Site Geophysicist after the conclusion of each day's data acquisition activities. The Field Geophysicist is responsible for the field component of the geophysical investigation including

planning data acquisition, ensuring data quality, resolution of instrumentation problems, and assisting with the review of intrusive investigation data. The Site Geophysicist is responsible for data processing, transfer of the raw and positionally corrected data to USAESCH geophysical representative on a weekly basis and technical review of geophysical and intrusive investigation data. The Field and Site Geophysicists both report to the Home Office Geophysicist.

5.3.4 Production Rates

5.3.4.1 The average anticipated geophysical survey production rate between the three Mapping Teams for the Eastern Bypass is 4.33 x ¼ acre grids per team per day (based on two DGPS and one USRAD equipped team). Factors that may affect the production rate include excessive grade, equipment maintenance, accessibility (i.e., remoteness of site), site-specific "noise" (i.e., radio transmissions, large magnetic storms) and other dynamic events.

5.3.5 Data Resolution

5.3.5.1 This information is discussed in **Section 5.4.5** of the SWWP.

5.3.6 Data Density

5.3.6.1 This information is discussed in **Section 5.4.6** of the SWWP.

5.3.7 Data Processing

5.3.7.1 The FWENC Site Geophysicist will perform preliminary geophysical and navigation data processing and Quality Control (QC) checks on a daily basis on site. The final analysis and interpretation of the data will also be performed on-site and at the FWENC Lakewood, Colorado office. Processing, QC, and analysis and interpretation of the data are performed with internally developed software that has been specifically produced to integrate and interpret digital geophysical data acquired with the applicable positioning systems. The specific parameters used to process the EM-61 and positional data may vary, however, the processing parameters and results are documented in digital computer files so that the sequence of events can be reconstructed and analyzed at a later date, if necessary. This level of documentation helps to ensure that the overall process is repeatable.

5.3.7.2 Digital processing/interpretation folders will be maintained for the survey so that the processing/interpretation sequence can be reproduced at a future date, if necessary. The format of the digital geophysical data, as well as the graphics produced, will be compatible with the existing project database protocols (USAESCH ASCII ADF space delimited x,y,z file format, with appropriate header information). Foster Wheeler Environmental shall preserve the integrity of the raw, positionally corrected data and ensure that these data are provided to a USAESCH representative on a weekly basis.

5.3.7.3 The geophysical and position data supplied to USAESCH will allow for corrections such as navigation, and instrument bias shift but there will be no filtering or normalization of this data. All corrections to the data and pertinent

field activities will be documented in a Microsoft Word file that will be delivered to USAESCH with the numerical data. Each grid of data shall be logically and sequentially named so that the file name can be easily correlated with the grid name used by other project personnel. This information is further discussed in **Section 5.4.7** of the **SWWP**.

5.4 LOCATION SURVEYING, MAPPING AND NAVIGATION

5.4.1 This information is discussed in **Section 5.5** of the SWWP.

5.5 INSTRUMENT STANDARDIZATION

5.5.1 This information is discussed in **Section 5.6** of the SWWP.

5.6 DATA PROCESSING, CORRECTION AND ANALYSIS

5.6.1 This information is discussed in **Section 5.7** of the SWWP.

5.7 QUANTITATIVE INTERPRETATION AND DIG SHEET DEVELOPMENT

5.7.1 This information is discussed in **Section 5.8** of the SWWP. The co-ordinates of individual targets will be identified along with an estimated radius for intrusive investigation to take into account multiple targets and systematic positional error. The geophysical analysts will use their judgment and ancillary information (signal gradient, anomaly shape and distance between peaks) to identify unique anomalies. Areas of increased target density will be identified on the dig sheets as "multiple targets probable" in order to assist excavation personnel to the highest degree possible.

5.8 ANOMALY REACQUISITION

5.8.1 It is anticipated that DGPS (stationary positioning) will be the primary method used to provide navigation assistance to relocate the x-y grid coordinates of interpreted targets. Anomaly co-ordinates will be provided to the Reacquisition Teams who will place numbered surveyor's pin flags at the anomaly location. Where it is appropriate, other methods such as USRADS, Robotic Total Station, measuring tape or other surveying methods may be used.

5.8.2 A separate excavation team will return to the grid and excavate each flagged location. The excavation information will be digitally logged on a field data collector and transferred to the site trailer on a daily basis.

5.9 FEED BACK PROCESS

5.9.1 Due to the extended approval time of the ESS over the Site Specific Work Plan (at least three months), a proportion of grids (~400) will have been geophysically mapped before the ESS is approved and full OE Removal is allowed to proceed. This is not an optimum situation as more effective geophysical results can be achieved if geophysical target selection is compared to the actual anomalies found at those locations. After discussions with USAESCH personnel, up to 10 grids mapped before approval of the ESS will have a proportion of selected anomalies intrusively sampled. Note that the grids

will not have a final clearance conducted on them until the ESS is approved and the anomaly sampling is for geophysical calibration purposes only.

5.9.2 Should intrusive results diverge significantly from interpretation data, a Root Cause Analysis shall be implemented to identify the processes that require refinement. Geophysical investigation components will be evaluated including data acquisition (coverage, density, quality, noise levels, positioning), data processing (merging of EM data and position data, filtering if necessary, background shifts), and data interpretation (anomaly analysis, computer calculations for locations, sizes, and depths). The procedures for target reacquisition will also be evaluated. Corrective measures will be implemented, as necessary, to ensure that subsequent interpretive data and/or reacquisition procedures are modified to more accurately reflect ground-truth results.

5.10 QUALITY CONTROL

5.10.1 Quality control mechanisms will be implemented to ensure the data acquisition, processing and interpretation, and target reacquisition practices are monitored to a sufficient level to meet the overall program objectives for a particular area.

5.10.2 The EM-61 units, DGPS, USRADS and Robotic Total Stations used during the project will be identified in the field records. Instrument functionality and repeatability tests will be digitally recorded and available for review by quality assurance (QA) personnel. Instrument-specific functional and testing procedures are described below.

5.10.3 At the beginning of each EM-61 data acquisition file prior to the commencement of coil movement, data will acquired for approximately 30 seconds to ensure the repeatability of the data measurements. At the commencement of coil movement, the instrument operator will traverse over a elongated metallic object (Schonstedt, rebar, etc.) a minimum of three times in opposite directions to ensure the detection capability of the EM-61, as well as provide timing information used to positionally shift the measurement locations.

5.10.4 No calibration will be made to the EM-61 or positional instrumentation since they are calibrated prior to leaving the factory. However, EM-61 and positioning measurements will be recorded over a portion of an existing data acquisition for each data acquisition session or at a designated location to provide information on the precision and repeatability of the entire data acquisition process.

5.10.5 Quality Control processes will be applied to the analysis and interpretation of the geophysical data. Significant processing and interpretation parameters are digitally logged to a computer file to provide an audit trail for QA. In addition, some targets interpreted to be the result of above ground cultural features (e.g., metallic monitoring wells, time synch target) may be selected for

target reacquisition to exhibit the repeatability of the acquisition, processing, interpretation, and target reacquisition processes.

5.11 CORRECTIVE MEASURES

5.11.1 This information is provided in **Section 5.12** of the SWWP.

5.12 RECORDS MANAGEMENT

5.12.1 This information is presented in **Sections 5.4.7** and **13** of the SWWP.

5.13 INTERIM REPORTING

5.13.1 This information is presented for the geophysical data in **Section 5.4.7** of SWWP.

5.14 FINAL REPORTS AND MAPS

5.14.1 This information is presented in **Section 5.15** of SWWP.

6.0 SITE SAFETY AND HEALTH PLAN

6.1 GENERAL

6.1.1 Safety and health guidelines are discussed in **Section 6.0** of the **SWWP**. This plan contains information that is specific to the Eastern Bypass OE Removal Area and supplements the **SWWP** referenced above.

6.2 INTRODUCTION

6.2.1 This Site-Specific Safety and Health Plan (SSHP) has been prepared to address the hazards associated with characterization activities within this Task Order at Fort McClellan in Anniston, Alabama. This SSHP will be used in combination with the Site-Wide SSHP, and both plans will be available to workers during activities in the Eastern Bypass OE Removal Area. By their signatures, the undersigned certify that this SSHP will be utilized for the protection of the health and safety of workers during work tasks.
APPROVALS:

Arthur B. Holcomb, PE, CIH Project Manager — 10/24/02 Date

Gregory V. Williams, Task Order Manager — 10/24/02 Date

Mark Fletcher
Project Environmental and Safety Manager — 10/24/02 Date

Nathaniel Martin
UXO Safety Officer

6.3 SCOPE AND APPLICABILITY

6.3.1 This SSHP has been prepared in conformance with the Foster Wheeler Environmental, Health and Safety programs, policies and procedures; the U.S. Army Corps of Engineers Safety and Health Requirements Manual, EM 385-1-1; and the U.S. Army Corps of Engineers Safety and Occupational Health Document Requirements for Hazardous, Toxic and Radioactive Waste (HTRW) and Ordnance and Explosive Waste (OEW) Activities, ER 385-1-92.

6.3.2 The content of this SSHP may change or undergo revisions based upon additional information made available to safety and health personnel, monitoring results, or changes in the technical statement of work. Any changes proposed must be reviewed by the Foster Wheeler Environmental UXOSO and are subject to the approval of the Foster Wheeler Environmental Project Environmental and Safety Manager (PESM). Changes are also subject to the approval of the U.S.

Army Corps of Engineers, Engineering and Support Center, Huntsville (USAESCH). The Field Change Request Form, provided in **Attachment 6-1** of the SWWP, will be used to initiate such changes.

6.3.3 The protection of site workers and environmental safety and health are major concerns during site operations. The purpose of this plan is to ensure safe and healthful working conditions within this Task Order. The safety and health organization and procedures contained in this SSHP have been established based upon an analysis of the potential hazards, and personnel protection measures have been chosen based on these risks.

6.3.4 Compliance with this SSHP is required for all Foster Wheeler Environmental employees and their contractors, subcontractors, and visitors who may participate in activities within this Task Order. Refusal or failure to comply with the SSHP or violation of any safety procedures by field personnel and/or subcontractors may result in their immediate removal from the site following consultation with the Foster Wheeler Environmental PESM and the Project Manager (PM).

6.3.5 This SSHP addresses the following activities:

a. Mobilization/demobilization;
b. OE surface survey;
c. Brush clearance;
d. Survey study areas, establish corners and boundaries;
e. Establish geophysical test lines and grids;
f. Conduct geophysical surveys; and
g. Manual and mechanical excavation of anomalies.

6.4 STAFF ORGANIZATION, QUALIFICATIONS, AND RESPONSIBILITIES

The responsibilities of the project staff are described in the following paragraphs:

6.4.1 Project Manager (PM)

6.4.1.1 The Project Manager is Arthur B. Holcomb. It is the responsibility of the Project Manager to:

a. Ensure that full corporate resources are made available to the program, as needed;
b. Serves, as necessary, as an intermediary between the USAESCH contract officer (CO) and Foster Wheeler's corporate management; and

c. Assist the Task Order Manager in problem resolution/corrective action implementation.

6.4.2 Task Order Manager

6.4.2.1 The Task Order Managers are Greg Williams and Todd Biggs; it is the responsibility of the Task Order Managers to:

a. Provide the major point of control to ensure that the program's technical, financial and scheduling objectives are achieved;

b. Ensure implementation of this program through coordination with the responsible Project Environmental Safety Manager (PESM);

c. Conduct periodic inspections;

d. Participate in incident investigations;

e. Ensure the SSHP has all of the required approvals before any site work is conducted;

f. Ensure that the PESM or UXO Site Safety and Health Officer (UXOSO) is informed of project changes which require modifications of the site safety plan; and

g. Assume overall project responsibility for Project Health and Safety.

6.4.3 Project Environmental and Safety Manager (PESM)

6.4.3.1 The Project Environmental and Safety Manager (PESM) is Mark Fletcher. The responsibilities of the PESM are outlined and described in **Section 6.2.2** of the SWWP.

6.4.4 Senior UXO Supervisor (SUXOS)

6.4.4.1 The Senior UXO Supervisor (SUXOS) is Steve Neill. The responsibilities of the SUXOS are outlined and described in **Section 6.2.3** of the SWWP.

6.4.5 UXO Safety Officer (UXOSO)

6.4.5.1 The UXO Safety Officer (UXOSO) is Nathaniel Martin. The responsibilities of the UXOSO are outlined and described in **Section 6.2.4** of the SWWP.

6.4.6 Field Crew Personnel

6.4.6.1 Field crew personnel include all other persons entering the site for the purpose of assisting in the completion of the project. This includes, but is not limited to geophysicists, client representatives, subcontractors, regulatory personnel, and site workers. The responsibility of all field crew personnel are outlined and described in **Section 6.2.5** of the **SWWP**.

6.5 SOURCE AND NATURE OF CONTAMINATION

6.5.1 The data presented were obtained during previous archival research, response investigations, and remedial designs. The suspected types of OE associated with the Eastern Bypass OE Removal Area are presented in **Table 5.1.** The previous investigations conducted indicate that it was used both as an impact and training area.

6.6 HAZARD ANALYSIS AND RISK ASSESSMENT

6.6.1 This section presents an assessment of the potential hazards associated with the site activities including chemical hazards (Chemical Warfare Materials (CWM) and OE), physical hazards, and biological hazards.

6.6.2 Chemical Hazards

6.6.2.1 It is not anticipated that CWM will be encountered at the Eastern Bypass OE Removal Area. It is possible that lead could be encountered since there has been small arms and ammunition use at the base, however this has largely been ruled out by the EE/CA carried out by Zapata Engineering. It is not likely to present any significant occupational exposure as a result of any planned activities.

6.6.2.2 In the event of CWM material discovery all personnel will evacuate the area immediately in an upwind direction. The SUXOS will notify Foster Wheeler Environmental Site Office and the USAESCH Safety Representative. Foster Wheeler Environmental UXO personnel will standby the area until response elements arrive on scene or until directed by the USAESCH safety representative. The Foster Wheeler Environmental Site Office will notify the Ft. McClellan Transition Force Operations and other personnel listed on **Table 6.1** and in Appendix D as required.

Table 6.1
Emergency Telephone Numbers

Contact	Firm or Agency	Telephone Number
Emergencies	Calhoun County Emergency Services	911
Police	Anniston Police Dept.	(256) 238-1800
Fire	Anniston Fire Dept.	(256) 231-7644
Ambulance	Anniston EMS	(256) 237-8572
Hospital	Stringfellow Memorial	(256) 235-8900
HAZMAT Response	Anniston Police Dept.	(256) 237-3541
BRAC Environmental Coordinator, Mr. Ronald Levy	Fort McClellan	(256) 848-6853
Project Manager, Mr. Arthur B. Holcomb	Foster Wheeler Environmental Corporation	(256) 430-3701
TO Managers, Mr. Greg Williams Mr. Todd Biggs	Foster Wheeler Environmental Corporation	(256) 820-7904
PESM, Mr. Mark Fletcher	Foster Wheeler Environmental Corporation	(256) 430-3622
Project Manager, Mr. Daniel Copeland	USAESCH	(256) 895-1468
Poison Control Center		(800) 462-0800
Chemtrec		(800) 424-9300
National Response Center		(800) 424-8802
Fort McClellan Transition Force Operations		(256) 848-5680

6.6.3 **Physical Hazards.** The principal safety hazards, including physical hazards, are discussed in the Activity Hazard Analysis (AHA) in Attachment 6-1 for the different phases of the project. In addition to the AHAs, standing work rules and other safety procedures are described in **Section 6.15** of the SWWP.

6.6.3.1 **Heat Stress.** Potential hazards posed by heat stress and the recommended and/or required measures to control these hazards are described in **Section 6.14.1.1** of the SWWP.

6.6.3.2 **UXO/Explosives.** The Eastern Bypass OE Removal Area may contain Ordnance and Explosives (OE) and Ordnance and Explosives Waste (OEW). Only UXO trained personnel are authorized to handle OE and OEW material. The recommended and/or required measures to control these hazards are described in **Section 6.4.2.2** of the SWWP.

6.6.3.3 **Cold Stress.** Potential hazards posed by cold stress and the recommended and/or required measures to control these hazards are described in **Section 6.14.1.2** of the SWWP.

6.6.3.4 **Equipment Safety.** Potential hazards posed by heavy equipment operations and the recommended and/or required measures to control these hazards are described in **Section 6.15.2** of the **SWWP**. In addition to the requirements of the SWWP, during Mechanical Removal operations, armored heavy equipment operators will remain inside armored vehicles until **all** mechanical operations have ceased and verbal confirmation has been received from the on-site supervisor.

6.6.3.4.1 Mechanical sifting equipment, conveyor systems, and generators used to power this equipment have hazards that are unique to these types of equipment. All personnel who will assemble, operate, or maintain this equipment must be specifically trained to identify pinch points and hazards associated with conveyor rollers, high-pressure hydraulic lines, and high voltage hazard areas. Only adequately trained and competent personnel will be authorized to conduct operations, assemble, or maintain this equipment. Specific hazards are listed in the AHA's in Attachment 6-1.

6.6.3.5 **Hand and Power Tools.** Potential hazards posed by the use of hand and portable power tools and the recommended and/or required measures to control these hazards are described in **Section 6.15.9** of the **SWWP**. Safety measures for the use of these tools used for clearing and grubbing are as follows:

6.6.3.5.1Chain Saws

a. The engine shall be started and operated only when all co-workers are clear of the saw;

b. The operator will shut off the saw when carrying it over slippery surfaces, through heavy brush, and when adjacent to personnel; the saw may be carried running (idle speed) for short distances (less than 50 feet) as long as it is carried to prevent contact with the chain or muffler;

c. The engine shall be stopped for all cleaning, refueling, adjustments and repairs to the saw or motor, except where manufacturer's procedures require otherwise;

d. All chain saws shall have an automatic chain brake or kick back device;

e. The idle speed shall be adjusted so that the chain does not move when the engine is idling;

f. The operator will hold the saw with both hands during all cutting operations;

g. Face shields, safety glasses, long-sleeved shirts, safety chaps, steel toe safety boots, gloves, and hearing protection will be worn by operators during use; and

h. A chain saw must never be used to cut above the shoulder height.

6.6.3.5.2Chopping Tools

a. Chopping tools that have loose or cracked heads or splintered handles shall not be used;

b. Chopping tools shall be swung away from the feet, legs, and body, using the minimum power practical for control; and

c. Chopping tools shall not be driven as wedges or used to drive metal wedges.

6.7 BRUSH CLEARING AND GRUBBING OPERATIONS

6.7.1 Clearing and grubbing operations pose many potential hazards. These hazards include, but are not limited to being struck by falling debris, damaging equipment, tools, personnel and supplies as a result of improper tree felling and brush clearing activities. All clearing and grubbing activities shall be conducted in accordance EM 385-1-1, Section 31, Tree Maintenance and Removal and ANSI Z133.1-1994, Pruning, Trimming, Repairing, Maintaining, and Removing Trees, and Cutting Brush – Safety Requirements. These requirements include, but are not limited to, the following:

6.7.2 Tree Felling

a. Ensure footing before starting to cut, clear away brush and other materials that might interfere with cutting operation;

b. A notch and back cut shall be used in felling trees over 5 in diameter, no tree shall be felled by "slicing" or "ripping " cuts;

c. The employee shall work from the up hill side when ever possible;

d. The work area shall be cleared to permit safe working conditions;

e. Just before the tree or limb is ready to fall an audible warning shall be given to all those in the area: all persons shall be safely out of range when the tree or limb falls; and

f. Persons shall be kept back from the butt of a tree that is starting to fall.

6.7.3 Brush Removal and Chipping

a. Rotary drum and disk-type tree or brush chippers not equipped with a mechanical in-feed system shall be equipped with an in-feed hopper not less than 85 in. (the sum of the horizontal distance from the chipper blade out along the center of the chute to the end of the chute and the vertical distance from the chute down to the ground) and shall have sufficient height on its side members to prevent

personnel from contacting the blades or knives of the machine during normal operations.

b. Rotary drum and disk-type tree or brush chippers not equipped with a mechanical in-feed system shall have a flexible anti-kickback device installed in the in-feed hopper for the purpose of protecting the operator and other persons in the machine area from the hazards of flying chips and debris.

c. Disk-type tree or brush chippers equipped with a mechanical in-feed system shall have a quick stop and reversing device on the in-feed: the activating mechanism for the quickstop and reversing device shall be located across from the top, along each side of, and as close as possible to the feed end of the in-feed hopper and within easy reach of the operator.

d. The feed chute or feed table of a chipper shall have sufficient height on its side members to prevent operator contact with the blades or knives during normal operation. Brush chippers shall be equipped with an exhaust chute of sufficient length or design to prevent contact with the blade.

e. All workers feeding brush into chippers shall wear eye protection. Workers feeding the chipper shall not wear loose hair or clothing, gauntlet-type gloves, rings and watches.

f. Employees shall never place hands, arms, feet, legs or any other part of the body on the feed table when the chipper is in operation or the rotor is turning; push sticks – of material which can be consumed by the chipper – shall be used.

g. Brush chippers should be fed from the side of the feed table centerline, and the operator shall immediately turn away from the feed table when the brush is taken into the rotor or feed rollers.

6.7.3.1 **Heavy Equipment.** Potential hazards posed by the use of heavy equipment and the recommended and/or required measures to control these hazards are described here and in **Section 6.15.2** of the SWWP.

a. All personnel shall be physically, medically, and emotionally qualified for performing the duties to which they are assigned. Some factors to be considered in making work assignments are strength, endurance, agility, coordination, and visual and hearing acuity.

b. At no time while on duty may employees use or be under the influence of alcohol, narcotics, intoxicants, or similar mind-altering substances. Employees found under the influence of or consuming such substances will be immediately removed from the job site.

c. Operators of any equipment or vehicle shall be able to read and understand the signs, signals, and operating instructions in use.

d. Operators of mobile construction equipment shall not be permitted to exceed 10 hours of duty time in any 24-hour period, including time worked at another occupation, without an interval of eight consecutive hours of rest.

e. Equipment shall be inspected daily prior to beginning work.

6.8 BIOLOGICAL HAZARDS

6.8.1 The principal safety hazards, including biological hazards, are discussed in the Activity Hazard Analysis (AHA) in **SWWP** for the different phases of the project. In addition to the AHAs, standing work rules and other safety procedures associated with biological hazards are described in **Section 6.4.3** of the SWWP.

6.9 TRAINING

6.9.1 This information is reviewed in the **SWWP - Section 6.5.**

6.10 PERSONAL PROTECTIVE EQUIPMENT

6.10.1 All personnel entering the work area designated as a construction zone will wear Level D protection as it applies to the work they are performing. The following PPE will be utilized as follows:

a. Long Pants
b. Coveralls can be worn in place of pants and shirt
c. Work Boots that comply with ANSI Standard Z41
d. Safety Glasses that comply with ANSI Standard Z87 when outside the protective armor
e. Hard Hat that complies with ANSI Standard Z89 when around operating machinery requiring overhead protection
f. Hearing protection that provides a noise reduction rating of less than 85dB in a high noise environment
g. Leather Work Gloves when handling trees, metal or other debris
h. Face Shield that complies with ANSI Standard Z89 (for use with powered cutting equipment during vegetation removal phase)
i. Chainsaw Chaps (Kevlar) (for use with powered cutting equipment during vegetation removal phase)

6.11 MEDICAL SURVEILLANCE

6.11.1 This information is reviewed in the **SWWP - Section 6.7.**

6.12 ENVIRONMENTAL AND PERSONNEL MONITORING

6.12.1 It is not anticipated that field activities will encounter situations that would require air monitoring. If air monitoring is required, the work will be

conducted in accordance with 29 CFR 1910.146; the **SWWP - Section 6.8**, and the Foster Wheeler EHS References. Site/ task specific procedures will be included in the SSHP Addendum.

6.13 SITE CONTROL

6.13.1 This information is reviewed in the **SWWP - Section 6.9.**

6.13.2 A fence will be erected around the Mechanical Processing Area. This area will be designated as a **construction zone**. All personnel entering this construction zone **will** wear all appropriate PPE listed in Section 6.10.1.

6.13.3 Access into the construction zone will not be permitted until verified by radio communications that all equipment operations have stopped. Personnel requiring entry into the construction zone must contact the on-site supervisor to stop all operations that may cause unintentional detonation and proceed into the construction zone only after verbal confirmation is received from the on-site safety observer.

6.14 PERSONNEL AND EQUIPMENT DECONTAMINATION

6.14.1 This information is reviewed in the **SWWP - Section 6.10.**

6.15 EMERGENCY RESPONSE AND CONTINGENCY PROCEDURES (ON-SITE AND OFF-SITE)

6.15.1 This information is reviewed in the **Final General Site-Wide Plan, Section 6.12.**

6.16 CONFINED SPACE ENTRY

6.16.1 It is not anticipated that field activities will encounter situations that would require confined space entry. If confined space entry is required, the work will be conducted in accordance with 29 CFR 1910.146 and the Foster Wheeler EHS References. Site/ task specific procedures will be included in the SSHP Addendum.

6.17 SPILL CONTAINMENT

6.17.1 If spill containment is required, the work will be conducted in accordance with 29 CFR 1910.146, **SWWP - Sections 6.12.14** and **6.12.15**, and the Foster Wheeler EHS References.

6.18 HEAT/ COLD STRESS MONITORING

6.18.1 This information is reviewed in the **SWWP - Section 6.14.**

6.19 STANDARD OPERATING PROCEDURES, ENGINEERING CONTROLS AND WORK PRACTICES

6.19.1 Information and equipment specific to this project are discussed in the AHAs. Further information is also available in the **SWWP- Section 6.15.**

6.20 LOGS, REPORTS, AND RECORD KEEPING

6.20.1 This information is reviewed in the **SWWP - Section 6.16.**

6.20.2 Contractor forms needed for this task order are provided in Appendix D.

7.0 LOCATION SURVEYS AND MAPPING PLAN

7.1 GENERAL

7.1.1 A Location Surveys and Mapping Plan was prepared in accordance with USAESCH **DID OE-005-7, Location Surveys and Mapping Plan**. See **Section 7 - Location Surveys and Mapping Plan**, in the **SWWP** for further detail.

8.0 WORK, DATA, AND COST MANAGEMENT PLAN

8.1 GENERAL

8.1.1 The purpose of this Work, Data and Cost Management Plan is to ensure the effective management of allocated funds, manpower, and equipment. This plan describes the resources and tools Foster Wheeler Environmental will use to manage the project to ensure effective Task of the required scope of services.

8.1.2 The Task Order Manager manages the day-to-day operation of the project and reports directly to the Foster Wheeler Environmental Project Manager. After the preparation of the work plan and associated documents, the Task Order Manager is responsible for the implementation, conduct, change management and closeout of the project. The following is a synopsis of the Project Management Approach that will be undertaken by the Task Order Manager on this task.

8.2 PROJECT MANAGEMENT APPROACH

8.2.1 The Task Order Manager in conjunction with the appropriate members of the project team will review the following areas periodically to ensure that the objectives stated in the Statement of Work are carried out. This program management approach is designed to ensure that controls are in place to ensure timely performance of the SOW and the use of correct procedures.

a. **Work Plan.** This Work Plan will be reviewed as required to ensure that the approaches and procedures utilized in this Task Order continue to provide the best product and outcomes possible. Any required changes to the work plan will be discussed with the appropriate personnel and a Change Request will be initiated and revisions shall be distributed upon approval.

b. **Environmental Health & Safety.** The Task Order Manager, the UXO Safety Officer and other key project staff shall regularly review the EHS aspects of the project. Information on EHS issues will be communicated daily to all personnel during the morning safety brief.

c. **Risk Awareness and Management.** FWENC maintains a rigorous approach to Risk Awareness and Management both through extensive higher management and executive reviews and also through the FWENC Task Initiation Procedure (TIP) and subsequent Risk Management Plan (RMP). The TIP and RMP are internal documents reviewed by several specialists within the corporation and are required to be reviewed and updated as conditions change or new situations arise.

d. **Status and Monitoring.** Status and Monitoring shall be carried out by managers at all levels during this Task Order. The basis of this plan is a Microsoft Access database designed to provide information on the critical drivers of the task. This information ranges from which grids have had brush clearance carried out to the details of the anomalies identified during the final grid Quality Control phase of the project. Team separation distances and exclusion zones shall also be managed with this information.

e. **Project Controls.** Project Controls encompasses the schedule and financial facets of the Task Order. The Assistant Project Manager/Project Controls Engineer shall assist the Task Order Manager in monitoring financial and schedule information for inclusion into project management decisions and periodic reports (weekly and monthly).

f. **Procurement.** The Task Order Manager is responsible for initiating procurement of all personnel, equipment and services and will monitor the conduct of sub-contracts and payment details. Close interaction with FWENC sub-contract and procurement specialists shall be maintained.

g. **Quality.** In conjunction with the UXO Quality Control Specialist, periodic reviews shall be carried out on the QC aspects of the Task Order. Further details are contained in **Chapter 11 – Quality Control.**

h. **Staffing and Resource Management.** The Task Order Manager in conjunction with the SUXOS shall periodically review staffing and resource issues on the project and plan the efficient mobilization and demobilization of staff and resources and replacement/rotation where applicable.

i. **Cash Management.** The Task Order Manager in conjunction with the Services Cost Engineer and Project Controls Engineer shall prepare and issue invoices monthly to USAESCH for services performed under the project. Payment of invoices for services and sub-contractors shall also be managed.

j. **Communications.** The effectiveness of the communications equipment and written and verbal communications internally and with USAESCH shall be reviewed.

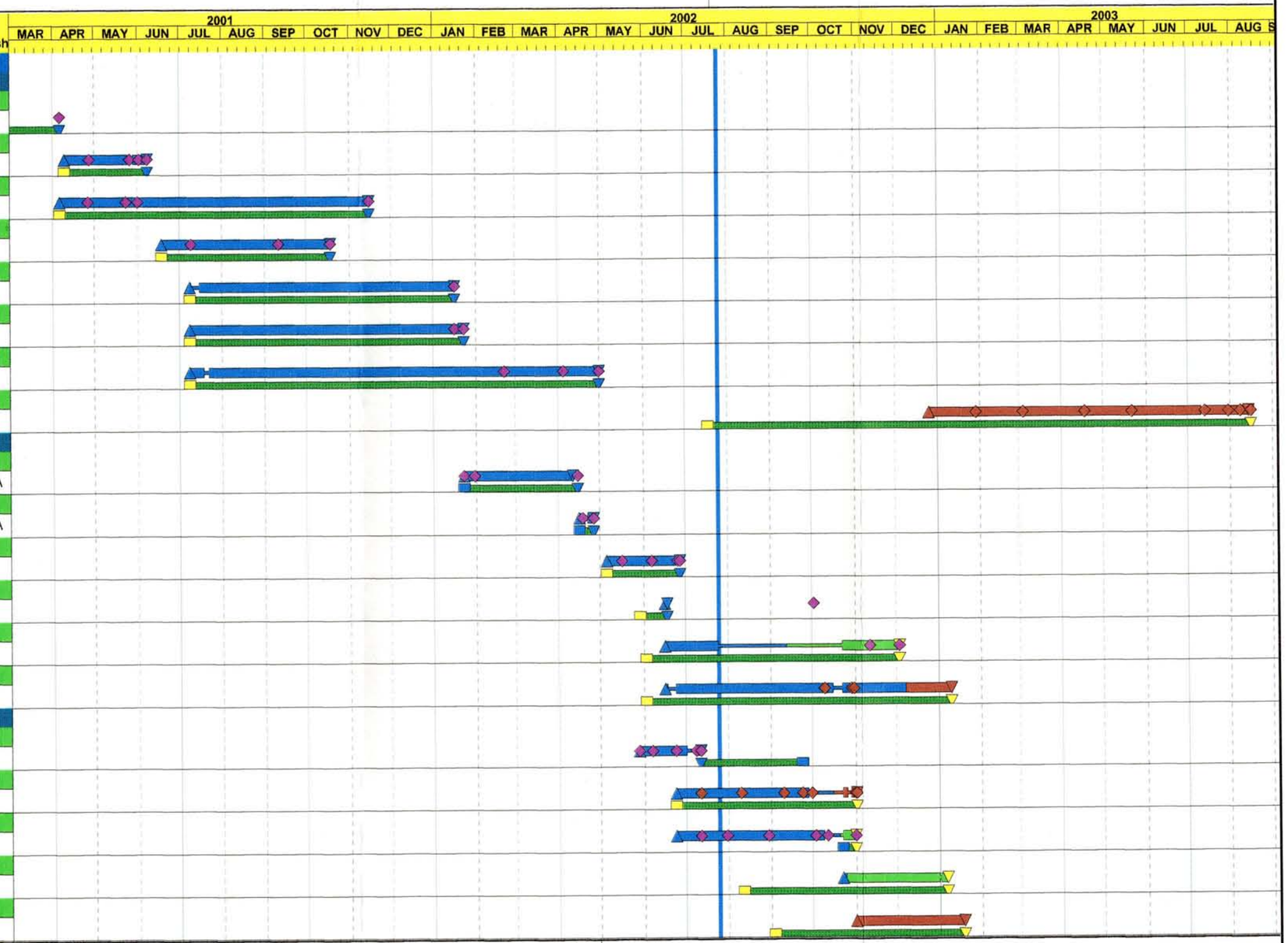
k. **Document Control.** The Task Order Manager shall be primarily responsible for the preparation, review, amendment and issue of all documents including the ESS, Work plan, notifications, weekly reports, monthly reports and the Removal Report.

8.3 SCHEDULE

8.3.1 For details of the schedule see Figure 8.1 – Task Order Schedule.

Eastern Bypass OE Removal
Summary Schedule
Figure 8.1

Activity ID	Activity Description	Orig Dur	Early Start	Target 1 Early Start	Early Finish	Target 1 Early Finish
Ft McClellan EE/CA and OE Removal						
Eastern Bypass OE Removal						
+ Contract Preparation						
		85	04DEC00A	04DEC00	05APR01A	05APR01
+ Work Plan						
		43	09APR01A	09APR01	07JUN01A	07JUN01
+ Explosive Safety Submission						
		157	06APR01A	06APR01	15NOV01A	15NOV01
+ Grid Preparation						
		70	18JUN01A	18JUN01	18OCT01A	18OCT01
+ Geophysical Survey-Grids						
		106	09JUL01A	09JUL01	15JAN02A	15JAN02
+ Data Analysis						
		109	09JUL01A	09JUL01	22JAN02A	14FEB02
+ Intrusive Activities						
		164	09JUL01A	09JUL01	30APR02A	04APR02
+ Removal Report						
		128	26DEC02	18JUL02	15AUG03	30JAN03
Eastern Bypass Extension						
+ Contract Preparation						
		45	23JAN02A	23JAN02A	14APR02A	14APR02A
+ Work Plan						
		8	16APR02A	16APR02A	25APR02A	25APR02A
+ Grid Preparation						
		31	06MAY02A	06MAY02	27JUN02A	13JUN02
+ Geophysical Survey-Grids						
		1	17JUN02A	30MAY02	17JUN02A	18JUL02
+ Data Analysis						
		95	17JUN02A	03JUN02	03DEC02	01AUG02
+ Intrusive Activities						
		115	17JUN02A	03JUN02	09JAN03	05SEP02
Eastern Bypass Mechanical Removal						
+ Contract Preparation						
		25	29MAY02A		11JUL02A	23SEP02
+ Work Plan						
		74	24JUN02A	24JUN02	01NOV02	19SEP02
+ Explosive Safety Submission						
		74	24JUN02A		31OCT02	12SEP02
+ Grid Preparation						
		0		12AUG02	06JAN03	19NOV02
+ Intrusive Activities						
		64	01NOV02	03SEP02	18JAN03	10DEC02



Start Date	01SEP99
Finish Date	15SEP06
Date	25JUL02
Date	23OCT02 13:36

Early Bar
Target
Progress Bar
Critical Activity

2215

Foster Wheeler Environmental

Eastern Bypass Schedule

Sheet 1 of 1

Date	Revision	Checked	Approved

9.0 PROPERTY MANAGEMENT PLAN

9.1 GENERAL

9.1.1 A Property Management Plan was prepared in accordance with USAESCH DID **OE-005-9, Property Management Plan.** See **Section 9 - Property Management Plan**, in the SWWP.

10.0 SAMPLING AND ANALYSIS PLAN

10.1 GENERAL

10.1.1 A Sampling and Analysis Plan are not applicable for this Task Order.

11.0 QUALITY CONTROL PLAN

11.1 GENERAL

11.1.1 This Quality Control Plan has been prepared in accordance with the SOW and contract specifications. All QC documentation will be submitted as part of or as supporting documentation for the final report. All QC records and documentation will be kept on site and made available for government inspection upon request.

11.2 DUTIES AND RESPONSIBILITIES

11.2.1 Site Quality Control Manager. The Site Quality Control Manager is responsible for:

a. Implementing the quality control plan;
b. Conducting quality control indoctrination training for project personnel;
c. Initiating QC surveillance and audit consistent with project QC plan and program QC policies and procedures;
d. Recommending changes to the Quality Control Plan;
e. Providing weekly project QC update to project/Task order manager;
f. Directly communicating with client QA project oversight;
g. Directing and supervising the activities of personnel assisting in the performance of surveillance and inspection activity;
h. Completing reports and other documentation;
i. Implementing the three phase control process;
j. Maintaining a log of activities; and
k. Issue stop work request when conditions warrant.

11.2.2 UXO Quality Control Specialist. The UXO Quality Control Specialist is responsible for:

a. Conducting audit and surveillance activity;
b. Completing forms and other documentation;
c. Conduct preparatory, initial, and follow-up inspections;
d. Maintain log of activities; and
e. Other duties as directed by the site QC manager.

11.3 AUDIT PROCEDURES

11.3.1 Quality Control is conducted using a three-phase control process; preparatory, initial, and follow-up inspection/audits to ensure processes are in

control and opportunities for improving processes are captured and implemented. Personnel conducting Quality Control have stop-work authority and are organizationally independent from the processes. Figure 11.1 illustrates the simplified clearance process of the Task order.

11.3.2 Preparatory Phase

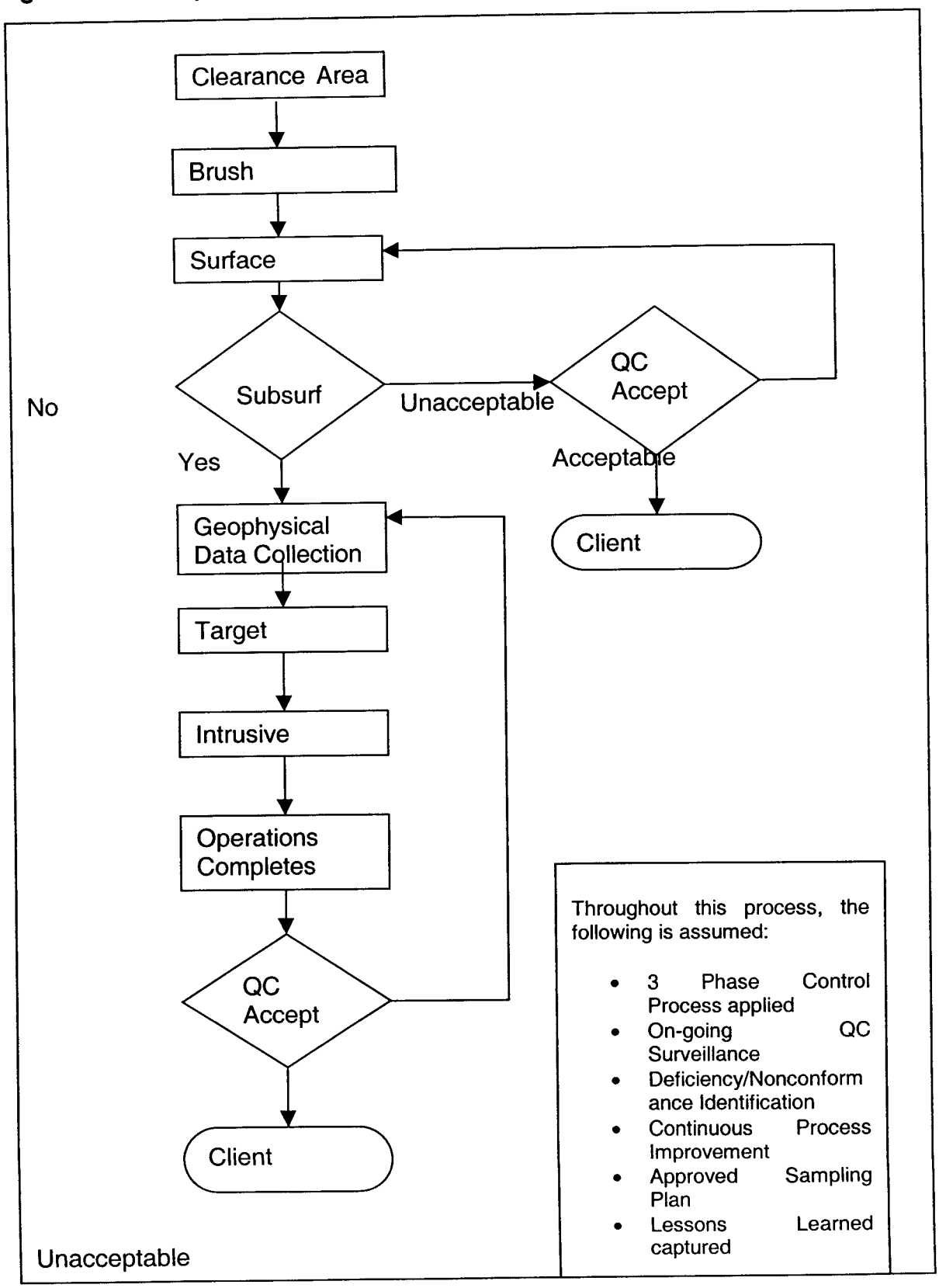
11.3.2.1 A preparatory phase inspection will be performed prior to beginning each definable feature of work. The purpose of this inspection will be to review applicable specifications and verify that the necessary resources, conditions, and controls are in place and compliant before the start of work activities. The personnel responsible for the work activity are responsible for ensuring that:

a. Appropriate plans and procedures are developed and approved;
b. Personnel required for the activity are identified and positions filled;
c. Training requirements are identified and training complete;
d. Preliminary work and coordination has been completed; and
e. Equipment and materials required to perform the work has been identified and is available.

11.3.2.2 The following QC actions are performed by the QC Staff for each preparatory phase inspection:

a. Verify that appropriate plans and procedures are developed, approved and are available;
b. Verify personnel identified are available and meet the requirements/qualifications for the position or waivers obtained from the client;
c. Verify that the required training has been performed
d. Verify identified equipment is available, functional, and appropriate for the job;
e. Verify that the preliminary work and coordination have been accomplished
f. Verify that level of quality expected is understood;
g. Verify Work Plan and applicable SOP's have been reviewed and understood by the workers; and
h. Brief process improvement program.

Figure 11.1 Simplified Clearance Process



11.3.2.3 The specific QC activities performed during the preparatory phase, and results of those activities, will be documented on the QC Surveillance Report, which will be attached to the Daily Quality Control Report.

11.3.2.4 Discrepancies between existing conditions and approved plans/ procedures will be resolved and corrective actions taken for unsatisfactory and nonconforming conditions identified during a preparatory phase inspection.

11.3.2.5 The UXOSO will discuss job hazards with site personnel and verify that the necessary safety measures are in place and ready for use.

11.4 INITIAL PHASE INSPECTION

11.4.1 An initial phase inspection will be performed the first time a definable feature of work is performed. The purpose of the inspection will be to check the preliminary work for the compliance with procedures and contract specifications. Another aim is to establish the acceptable level of workmanship, check safety compliance, review the preparatory phase inspection, and check for omissions and resolve differences of interpretation.

11.4.2 The following will be performed for each definable feature of work:

a. Deficiencies identified during the preparatory phase have been corrected;

b. Requirements of quality of workmanship will be established;

c. Completion of readiness review actions verified;

d. Differences of interpretation will be resolved;

e. Work Plan and applicable documents reviewed to ensure that the requirements are being met; and

f. Performance of work will be observed and adequacy of work verified.

11.4.3 Discrepancies between site practices and approved plans/procedures will be resolved. Corrective actions for unsatisfactory conditions or practices will be verified by the Site QC Manger or his designee, prior to granting approval to proceed.

11.4.4 The specific QC activities performed during the initial phase, and results of those activities, will be documented on a QC Surveillance Report and attached to the Daily Quality Control Report.

11.5 FOLLOW-UP PHASE INSPECTION (SURVEILLANCE)

11.5.1 The follow-up phase inspection is performed on a scheduled and unscheduled basis. The purpose of the inspection is to ensure a level of continuous compliance and workmanship. The Site QC Manager is responsible for on-site monitoring of the practices and operations taking place and verification of continued compliance with the specifications and requirements of the statement of work and approved Sop's. The following will be performed for each definable feature of work:

a. Inspections/surveillance to ensure that the work is in compliance with the statement of work and work plans;

b. Inspections/surveillance to ensure the required level of workmanship is maintained;

c. Inspections/surveillance to ensure each project log book is properly filled out and maintained;

d. Inspections/surveillance to ensure data management system is properly tracked and backed up; and

e. Inspections/surveillance to check the "false positive" anomalies using a statistically valid sampling plan (i.e. MIL-STD-1916) or 5%.

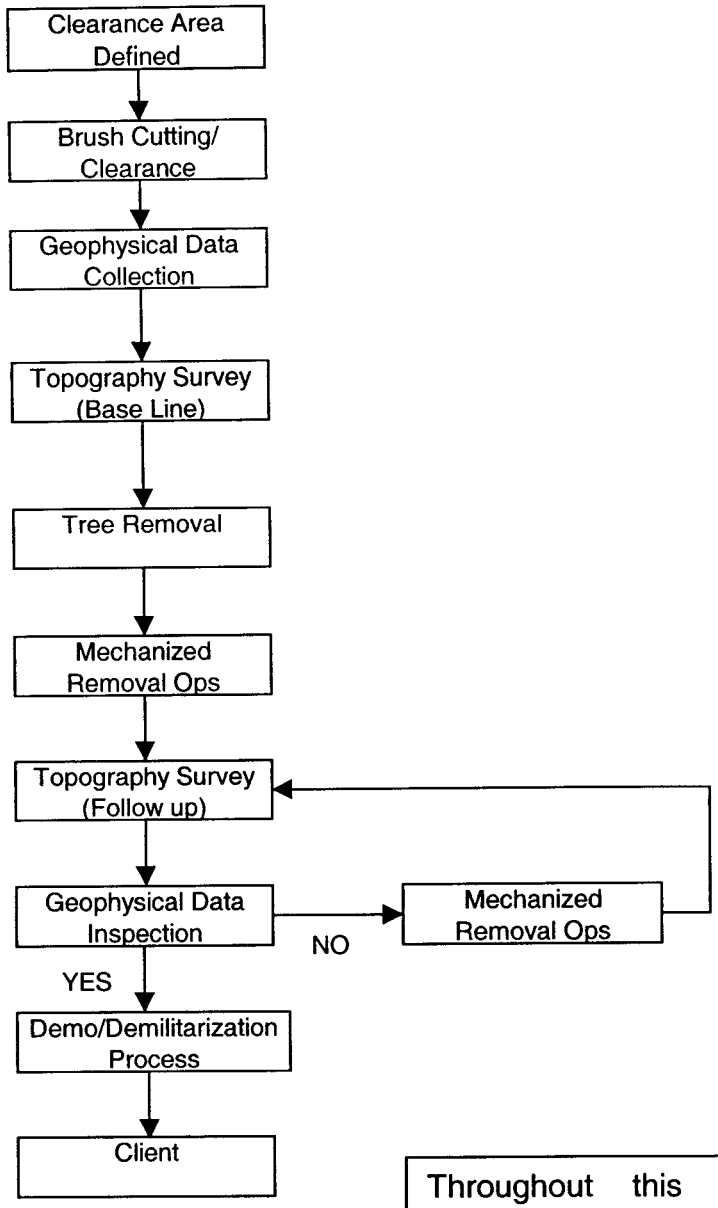
11.5.2 Follow-up results either negative or positive will be documented on a Surveillance Report and attached to the Daily Quality Control Report.

11.6 GEOPHYSICAL ACCEPTANCE INSPECTION

11.6.1 After work is complete, an acceptance inspection will be conducted using a sampling plan. The sampling plans/procedures that may be used are MIL-STD 1916 or other client directed plans, such as a minimum 10% check. For the 40.7-acre extension, the sampling plan selected is the minimum 10% check with a handheld instrument (Vallon VMX2 or equivalent). For the Armored Mechanical Ordnance Removal there will be an initial 100% geophysical mapping of the defined clearance area. Periodic geophysical mapping or handheld magnetometer checks will be conducted as a QC inspection to ensure enough soil has been removed and the contaminated area has been cleared. Upon completion, a final 100% geophysical mapping will be conducted prior to turnover. The site geophysicist will analyze the data to determine if anomalies are present and their location. If no additional anomalies are located the QC Specialist will present the grid to the USAESCH Safety Specialist who will conduct his QA inspection. Process and product QC inspections will also be conducted throughout the project. Figure 11.2 illustrates the simplified Armored Mechanical Ordnance Removal process. When MIL-STD 1916 is selected as the sampling plan, it will be applied using verification level (VL) III, inspection by attributes, inspection by lots, using switching procedures in the standard. The

method of conducting the inspection will be to apply the sampling plan to areas completed, collect data in those areas using the same type of equipment as the field teams, process the data, identify anomalies, and excavate the anomalies to determine the nature of the anomaly.

Figure 11.2 Armored Mechanical Ordnance Removal Simplified Clearance Process



Throughout this process, the following is assumed:

3 Phase Quality Control Process applied
On-going QC Surveillance
Deficiency/Nonconformance Identification

11.6.2 Criteria for accepting land parcels that have completed sub-surface clearance are no UXO or UXO look-a-like found above the contract performance line. IAW USAESCH DID OE-005-05, the contract performance line is defined by the calculations in the following table:

log(d) = 1.354 log(dia) – 2.655 (mag) *log(d) = 1.002 log(dia) – 1.961 (EM)*
Notes: d = actual depth to top of buried UXO, in meters. dia = diameter of minor axis of UXO, in millimeters "d" corresponds to the required clearance depth for that particular location on the project site and UXO "dia" is the diameter of the minimum size item, as determined by the project team, that the geophysical investigation is responsible for detecting.

11.6.3 All conditions observed during the acceptance inspection will be documented. Conditions that are identified as questionable will be evaluated by project management and site QC manager to determine the acceptability. When a withhold condition is identified a deficiency or nonconformance report will be issued and corrective action must be taken to correct the condition prior to offering the product to the client. Inspections will be documented on the Inspection Report contained in Appendix D.

11.7 DEFICIENCIES AND NONCONFORMANCE

11.7.1 All deficiencies or nonconforming conditions discovered during inspection or other QC functions will be noted on either a Deficiency or Nonconformance Report (NCR) as appropriate. These two forms are contained in Appendix D along with the Corrective Action Request Log for tracking these reports. All deficiencies and nonconformance conditions will be resolved prior to completion of the project and in the most timely manner possible. The Daily QC Report will include a report on each Deficiency/NCR that was completed and closed out for the day.

11.7.2 It is the responsibility of all personnel on the project to identify deficiencies and nonconforming conditions to their supervisor or manager as soon as they are identified. Deficiencies and nonconforming conditions are not necessarily a "bad thing", however, they do not have a negative connotation. Deficiencies and nonconforming conditions should be considered opportunities to improve the process.

11.8 ROOT CAUSE ANALYSIS

11.8.1 Both the deficiency and nonconformance report forms contain an area for the entry of information regarding the cause of the problem and proposed resolution. The determination of the root cause of a deficiency or nonconformance is an integral part of the QC process. The depth and extent of the root cause analysis depends on the situation. It may be as simple (minor) as an overlooked step or procedure or be a complicated process. Root cause analysis is the responsibility of the functional manager or his/her designee with the assistance of Quality Control Representatives. Criteria considered in the analysis will include:

a. Staff qualifications and training;
b. Adequacy of procedures;
c. Adequacy of equipment; and
d. Adequacy of QC measures.

11.8.2 Input will be obtained as necessary from field personnel and technical advisors in order to identify the factors, which led to the problem.

11.8.3 The root cause is always "upstream" from where the problem was detected. Two strategies that will be employed for determining the root cause of a deficiency or NCR for this project are: 1) tracing the problem back to the source, and 2) evaluation of the cause using basic questions such as who, what, when, where, why, and how. Why, is probably the most beneficial question, when attempting to arrive at a root cause. This question may need to be asked multiple times before the cause is identified. For example "*Why did A happen?*" Answer: *"Because of B," "Why did B happen?"* Answer: *"Because of C."* This process is carried on until the real cause is identified.

11.9 CORRECTIVE ACTION

11.9.1 Following the root cause analysis, the Site QC Manager will perform analysis of potential solutions (corrective actions) to determine which remedy is most effective in correcting the problem. The process will include all appropriate personnel and will be documented via meeting notes and information listed in the proper sections on the deficiency notice or NCR report. Potential remedies considered may include:

a. Supplemental personnel training;
b. Changes of equipment or modification of equipment currently in use;
c. Acquisition of supplemental equipment;
d. Implementation of new procedures or modification of existing procedures; and

e. Changes in QC procedures.

11.9.2 The decision for appropriate corrective action to implement is the responsibility of the Task Order Manager, however, all parties involved prior to implementation should agree upon this decision.

11.9.3 Successful implementation of corrective action will be documented on the deficiency or nonconformance report. The project QC representative will verify through a follow-up phase surveillance that the corrective action implemented has corrected the deficiency or nonconforming condition and is sufficient to prevent recurrence.

12.0 ENVIRONMENTAL PROTECTION PLAN

12.1 GENERAL

12.1.1 An Environmental Protection Plan was prepared in accordance with USAESCH DID **OE-005-12, Environmental Protection Plan**. See **Section 12 - Environmental Protection Plan**, in the SWWP.

13.0 INVESTIGATIVE DERIVED WASTE PLAN

13.1 GENERAL

13.1.1 An Investigative Derived Waste Plan was prepared in accordance with USAESCH DID **OE-005-13, Investigative Derived Waste Plan**. See **Section 13 - Investigation Derived Waste Management Plan**, in the SWWP.

14.0 GEOGRAPHIC INFORMATION SYSTEMS PLAN

14.1 GENERAL

14.1.1 A Geographical Information Systems Plan was prepared in accordance with USAESCH DID **OE-005-14, Geographical Information Systems Plan.** See **Section 14 - Geographical Information Systems Plan**, in the SWWP.

15.0 TECHNOLOGY DEMONSTRATION FOR DIRECT DISPOSAL OF UXO BY MECHANICAL SHREDDING.

15.1 The mechanical ring mill shredder used for the demilitarization and scrap processing, as described in Section 2.3.14, will be used to conduct a limited test of this technology for direct disposal and demilitarization of OE/UXO items. That is, potential OE/UXO and assorted metal debris, not to exceed a 60mm mortar explosive weight per item, will be processed directly through the shredder without any inspection or prior demolition of the items. This innovative technology testing will be conducted after all other mechanical removal, sorting, and disposal operations have been completed.

15.1.1 Initial testing of this technology was conducted at the Redstone Arsenal Technical Testing Center in August 2002. Inert, practice, and certified ordnance scrap and live 60 mm HE mortars were shredded to validate the capability of the mechanics and structural integrity of the machine and its ability to survive detonations of limited size ordnance. These initial tests were successfully completed and demonstrated the capability of the equipment to effectively process both scrap and live ordnance. In order to complete the validation of the technology concept a second phase under on-site, field conditions is required. The use of the Fort McClellan Mechanical Removal Area provides an ideal site for a limited demonstration of collecting and processing potential UXO under similar conditions as would be expected if the technology were fully capable of being deployed.

15.1.2 The test will be conducted in the Shredder/Disposal Area, shown in Figure 2-3. All applicable aspects of the ESS amendment will be incorporated as part of this technology demonstration with respect to safety procedures. The items to be tested will be collected from the Eastern Bypass 2.36-inch rocket target area. The technology demonstration will be limited to a total of no more than 2000 pounds of ordnance and scrap items separated at the end of mechanical sorting process. These separated materials will be stored at the inspection/demolition area, within the secured fence, and guarded during non-working hours, until commencement of the demonstration. It is anticipated that this temporary stockpile will be required for approximately 3 days before the limited demonstration testing can occur.

15.1.3 The total number of 2.36-inch rockets removed from each grid at the rocket target site to date has been documented and can be used to anticipate the remaining levels of concentration for potential UXO rounds. A Net Explosive Weight (NEW) for this stockpile has been calculated based on an estimated number of 2.36-inch rockets that would be likely to occur in a volume of 2000-3000 cubic yards of in-place soils from the site. It is estimated that approximately 15 to 20 potential UXO 2.36-inch rockets will be in this stockpile. Each rocket contains 0.5 pounds of Pentolite explosive compound. The NEW for this stockpile would range between 13.5 and 18 pounds. The K24 distance is less than those shown in Appendix B of the ESS Amendment 1. In addition, this

stockpile will be semi-enclosed by the concrete barrier wall, shown on Figure 2-3, to direct any fragmentation and/or overpressure away from the working area of the shredder and its power and control systems. As a further safety factor the material can be separated into smaller piles within the inspection/demolition area, as necessary, to further minimize the amount of explosives potentially occurring in any one stockpile. The Q-D arc for this test area is shown at Figure 4-1.

15.2 Standard Test Procedures.

The required test steps and safety checks to conduct this test are listed below:

Delivery of the ordnance/scrap items from the Mechanical Processing Area to the inspection/demolition area will be by armored front-end loader, exactly as for the previous process of inspection, demolition, and demilitarization. Unprotected personnel are not allowed within the QD arc of the Mechanical Processing Area nor the disposal/shredding area during this delivery process.

15.2.1 The temporary stockpile of separated items (UXO/OE and Metal Scrap) within the inspection/demolition area will not exceed 2000 pounds, with any smaller, segregated stockpiles not exceeding 500 pounds each.

15.2.2 Guards will be provided during non-working hours for the duration of the temporary stockpile, or until such time as the testing begins for each day of testing.

15.2.3 The limited testing will be conducted in increments not to exceed 500 pounds of material.

15.2.4 Upon initiation of the testing operations, the Senior UXO Supervisor will control all access to, as well as site activities within the QD distance for the shredder site. Two-way radio and mobile phones will be used for positive control of site operations.

15.2.5 Two UXO Technicians will be stationed within the armored control booth at the site to oversee the tests and provide control of the site.

15.2.6 Upon approval of the SUXOS the start of the testing will begin by having the initial load of items delivered to the hopper of the shredder using the armored front-end loader. The materials will be fed to the hopper by the front-end loader, or by conveyor, if that option has been installed for the previous scrap processing operations.

15.2.7 The armored front-end loader will be moved outside the Shredder/Disposal Area.

15.2.8 The system operator will then start the shredder by remote control from the armored booth and observe the shredding operations via Closed Circuit Television (CCTV). Upon passage of all items through the shredder, the operator will shut down the shredder.

15.2.9 All shredded material will be collected in a steel roll-off box or similar steel container placed beneath the shredder.

15.2.10 A 30-minute wait out period will be observed after shut down of the shredder before personnel will be allowed to inspect the test results.

15.2.11 A SUXOS will then visually inspect the shredder and collection box to determine if any potential UXO remain intact or have potential remaining explosive capability.

15.2.12 Upon an all clear by the SUXOS, inspection of the hopper and cutter chamber in the shredder will be made to determine if any build-up of explosives is occurring on the cutter disks, hopper walls or other components within the shredding compartment.

15.2.13 Documentation of this test step and the results of the shredding operation will be made with digital video and still photography and field notes to ensure all activities and results are captured for report preparation.

15.2.14 This series of steps will be repeated until all tests are completed.

15.2.15 As a final cleanup process for the shredder, a charge of inert scrap metal and soil will be run through all areas of the cutter chamber to polish/remove any explosives that might have stuck to the metal components of the shredder. A final visual inspection will confirm that the shredder is free of residual explosive compounds.

15.2.16 All processed materials from this testing will be retained in a single, locked roll-off box or equivalent at the shredder until such time as the material can be manifested and shipped to a RCRA approved incinerator for disposal. The limited weight of explosive materials within the total weight of the metal items is expected to be much less than 1% of total weight.

15.3 Procedures for Detonations of Rounds Within the Shredder.

15.3.1 Based on the initial demonstration testing at Redstone Arsenal, the probability of a round detonating in the shredder is very low because of the low-speed operation and the shearing process. However, there is always the potential for a UXO to detonate at any point in this mechanical shredding

process. Therefore, in the event that an OE/UXO item detonates within the ring mill shredder during any portion of the testing, specific safety procedures are required to be observed. These steps are listed below:

15.3.1.1 Upon detection of an explosive event in the shredder during operations, the system operator in the armored control booth will observe and evaluate the operation of the shredder via the CCTV system.

15.3.1.1.1 If the shredder is continuing to operate without any apparent damage, the operator will continue to process the charge of materials until the shredder has processed all items into the collection bin beneath the shredder.

15.3.1.1.2 If the shredder has jammed and can not free itself via it's normal reverse cycling process, the operator will shut down the equipment.

15.3.1.1.3 Under either case above, the UXO Tech III will notify the SUXOS, call a halt to all operations at the site, and initiate a 30-minute wait period before leaving the control booth.

15.3.1.1.4 During the 30 minute wait, the operator will attempt to evaluate the conditions inside the shredder hopper and cutting chamber via the CCTV system to determine if any potential UXO items remain in the shredder, which might pose an explosive risk.

15.3.1.2 Upon closure of the 30 minute wait out period, the SUXOS will visually inspect the shredder hopper, cutting chamber, and collection box to determine any residual UXO risk.

15.3.1.3 In the event a potential UXO is in the shredder or the collection box, the SUXOS will arrange for demolition of the UXO item via standard hand demolition procedures. The item will be perforated/blown in place within the shredder or collection box. In no instance will such items be moved, unless the SUXOS and Tech III can both validate that the item is incapable of detonation.

15.3.1.4 In the event the shredder was jammed by a detonation within the machine, the clearance procedures in 15.3.1.2 and 15.3.1.3 above will be completed before any repairs are attempted on the machine. Once the machine is determined to be in a safe condition with respect to OE/UXO, the operator and contractor shall determine the requirements for repairs necessary to put the shredder back in operation.

15.3.1.5 Once repairs are completed, the testing will resume using the same procedures and processes as designated above.

15.3.1.6 In the event that the shredder can not be repaired in a timely manner, i.e., 24 hours, the remaining OE/UXO items in the stockpile will be inspected and disposed of via standard hand demolition practices, as were used for the previous disposal operation in support of the mechanical removal and sorting operation.