FINAL
CONFIRMATORY SAMPLING REPORT
FORT STEWART
HINESVILLE, GEORGIA

NOVEMBER 2007

Prepared for:

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DOCUMENT 2

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FORT STEWART
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DoD Contract Number: W912DR-05-D-0004

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Malcolm Pirnie, Inc., prepared this report at the direction of the United States Army Corps of Engineers (USACE). This document should be used only with the approval of the USACE. This report is based, in part, on information provided in other documents and is subject to the limitations and qualifications presented in the referenced documents.

NOVEMBER 2007

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TABLE OF ACRONYMS

Acronym	Definition
°F	Degrees Fahrenheit
3ID(M)	Third Infantry Division (Mechanized)
AEDB-R	Army Environmental Database – Restoration
amsl	Above Mean Sea Level
bgs	Below Ground Surface
BRAC	Base Realignment and Closure
cal	Caliber
CCC	Criterion Continuous Concentration
CMP AB	Composition AB
CMS	Corrective Measures Study
CN	Chloracetophenone
CS	Confirmatory Sampling
CSM	Conceptual Site Model
CTC	Cost-to-Complete
DERP	Defense Environmental Restoration Program
DMM	Discarded Military Munitions
DoD	Department of Defense
DOE	Department of Energy
DPW	Directorate of Public Works
EOD	Explosive Ordnance Disposal
ft	Feet
FTSW	Fort Stewart
FUDS	Formerly Used Defense Site
FY	Fiscal Year
GA	Georgia
GPS	Global Positioning System

TABLE OF ACRONYMS

Acronym	Definition
HBX	High Blast Explosive
HE	High Explosive
HEP	High Explosive Plastic
HMX	Cyclotetramethylenetetranitramine
HRR	Historical Records Review
ID	Infantry Division
m	meters
MC	Munitions Constituents
MEC	Munitions and Explosives of Concern
mm	Millimeter
MMRP	Military Munitions Response Program
mph	Miles Per Hour
MRS	Munitions Response Site
MS/MSD	Matrix Spike / Matrix Spike Duplicate
MRSPP	Munitions Response Site Prioritization Protocol
NCO	Noncommissioned Officer
NFA	No Further Action
PRG	Preliminary Remediation Goal
RCRA	Resource Conservation and Recovery Act
QC	Quality Control
RDX	Cyclotrimethylene trinitramine
RFI	Resource Conservation and Recovery Act Facility Investigation
SARA	Superfund Amendments and Reauthorization Act
SI	Site Inspection
TAL	Target Analyte List
TNT	Trinitrotoluene

TABLE OF ACRONYMS

Acronym	Definition
TPP	Technical Project Planning
U.S.	United States
USACE	United States Army Corps of Engineers
U.S.C.	United States Code
USEPA	United States Environmental Protection Agency
UXO	Unexploded Ordnance

GLOSSARY OF TERMS

Closed Range – A military range that has been taken out of service as a range and that either has been put to new uses that are incompatible with range activities or is not considered by the military to be a potential range area. A closed range is still under the control of a Department of Defense (DoD) component.

Defense Site – Locations that are or were owned by, leased to, or otherwise possessed or used by the DoD. The term does not include any operational range, operating storage or manufacturing facility, or facility that is used for or was permitted for the treatment or disposal of military munitions.

Discarded Military Munitions (DMM) – Military munitions that have been abandoned without proper disposal or removed from storage in a military magazine or other storage area for the purpose of disposal. The term does not include unexploded ordnance (UXO), military munitions that are being held for future use or planned disposal, or military munitions that have been properly disposed of, consistent with applicable environmental laws and regulations.

Explosive Ordnance Disposal (EOD) – The detection, identification, on-site evaluation, rendering safe, recovery, and final disposal of UXO and other munitions that have become an imposing danger (for example, by damage or deterioration).

Explosives Safety – A condition where operational capability and readiness, people, property, and the environment are protected from the unacceptable effects of risks of potential mishaps involving military munitions.

Formerly Used Defense Site (FUDS) – A DoD program that focuses on compliance and cleanup efforts at sites that were formerly used by the DoD. A FUDS property is eligible for the Military Munitions Response Program if the release occurred prior to October 17, 1986; the property was transferred from DoD control prior to October 17, 1986; and the property or project meets other FUDS eligibility criteria.

Military Munitions – All ammunition products and components produced for or used by the armed forces for national defense and security, including ammunition products or components under the control of the DoD, United States Coast Guard, Department of Energy (DOE), and National Guard. The term includes confined gaseous, liquid, and solid propellants; explosives, pyrotechnics, chemical and riot control agents, smokes, and incendiaries, including bulk explosives and chemical warfare agents; chemical munitions; rockets; guided and ballistic missiles; bombs; warheads; mortar rounds; artillery ammunition; small arms ammunition; grenades; mines; torpedoes; depth charges; cluster munitions and dispensers; demolition charges; and devices and components thereof.

The term does not include wholly inert items; improvised explosive devices; and nuclear weapons, nuclear devices, and nuclear components other than non-nuclear components of nuclear devices that are managed under the nuclear weapons program of the DOE after all required sanitization operations under the Atomic Energy Act of 1954 (42 United States Code [U.S.C.] 2011 et seq.) have been completed.

Munitions and Explosives of Concern (MEC) – This term, which distinguishes specific categories of military munitions that may pose unique explosives safety risks, includes: UXO, as defined in 10 U.S.C. 101(e)(5); DMM, as defined in 10 U.S.C. 2710(e)(2); and munitions constituents (e.g., trinitrotoluene [TNT], cyclotrimethylenetrinitramine [RDX]) present in high enough concentrations to pose an explosive hazard.

Munitions Constituents (MC) – Any materials originating from UXO, DMM, or other military munitions, including explosive and nonexplosive materials, and emission, degradation, or breakdown elements of such ordnance or munitions.

Munitions Debris – Remnants of munitions (e.g., fragments, penetrators, projectiles, shell casings, links, fins) remaining after munitions use, demilitarization, or disposal.

Operational Range – A range that is under the jurisdiction, custody, or control of the Secretary of Defense and that is used for range activities or, although not currently being used for range activities, that is still considered by the Secretary to be a range and has not been put to a new use that is incompatible with range activities.

Range – A designated land or water area set aside, managed, and used for range activities of the DoD. The term includes firing lines and positions, maneuver areas, firing lanes, test pads, detonation pads, impact areas, electronic scoring sites, buffer zones with restricted access, and exclusionary areas. The term also includes airspace areas designated for military use in accordance with regulations and procedures prescribed by the Administrator of the Federal Aviation Administration.

Transferred Range – A range that is no longer under military control and had been leased by the DoD, transferred, or returned from the DoD to another entity, including federal entities. This includes a military range that is no longer under military control, but that was used under the terms of an executive order, special-use permit or authorization, right-of-way, public land order, or other instrument issued by the federal land manager. Additionally, property that was previously used by the military as a range, but did not have a formal use agreement, also qualifies as a transferred range.

Transferring Range – A range that is proposed to be leased, transferred, or returned from the DoD to another entity, including federal entities. This includes a military range that was used under the terms of a withdrawal, executive order, special-use permit or authorization, right-of-way, public land order, or other instrument issued by the federal land manager or property owner. An active range will not be considered a transferring range until the transfer is imminent (generally defined as the transfer date is within 12 months and a receiving entity has been notified).

Unexploded Ordnance (UXO) – Military munitions that (A) have been primed, fused, armed, or otherwise prepared for action; (B) have been fired, dropped, launched, projected, or placed in such a manner as to constitute a hazard to operations, installations, personnel, or material; and (C) remain unexploded either by malfunction, design, or any other cause.

EXECUTIVE SUMMARY

The Department of Defense (DoD) established the Military Munitions Response Program (MMRP) under the Defense Environmental Restoration Program to address defense sites with munitions and explosives of concern (MEC) (which include unexploded ordnance [UXO] and discarded military munitions [DMM]) and munitions constituents (MC) located on current and former military installations. Properties classified as operational military ranges, permitted munitions disposal facilities, or operating munitions storage facilities are not eligible for the MMRP, nor are sites that had releases after September 30, 2002. The United States Army's inventory of closed, transferred, and transferring military ranges and defense sites has identified sites with UXO, DMM, or MC eligible for action under the MMRP. This report presents the results of the MMRP Resource Conservation and Recovery Act (RCRA) Confirmatory Sampling (CS) conducted at Fort Stewart (FTSW) in Bryan, Evans, Liberty, Long, and Tattnall counties, Georgia (GA).

FTSW consists of 279,081 acres and is located north of Hinesville, GA, approximately 40 miles southwest of Savannah, GA. FTSW is the largest Army installation east of the Mississippi River, spanning portions of Bryan, Evans, Liberty, Long, and Tattnall counties. Georgia Highway 119, which runs north to south from Pembroke to Hinesville, and Georgia Highway 144, which runs east to west from Richmond Hill to Glennville, bisect FTSW. Situated south of Interstate 16 and west of Interstate 95, the installation boundaries are roughly defined by the intersection of Interstate 16 and Interstate 95 and the cities of Richmond Hill, Hinesville, Glennville, Claxton, and Pembroke.

The Phase 3 Inventory report identified seven munitions response sites (MRSs) at FTSW. Research performed during the Historical Records Review (HRR) resulted in the addition of the Hero Road Trench Area as an MRS and the removal of Small Arms Range - 2 as an MRS. Small Arms Range - 2 was found to be ineligible for the MMRP as it is positioned completely within the operational footprint of FTSW. The seven MMRP eligible sites identified in the HRR dated September 2006 and, therefore, included in this CS are as follows:

- Anti-Aircraft Range - 1
- Anti-Aircraft Range 90-millimeter (mm) - 2
- Anti-Tank Range 90-mm
- Hand Grenade Course
- Small Arms Range - 1
- Small Arms Range - 3
- Hero Road Trench Area

The CS at the MMRP sites at FTSW included both MEC and MC field activities, which were conducted from March 13, 2007, through March 15, 2007, and April 30, 2007, through May 1, 2007.

MEC field activities included a magnetometer-assisted site walk and visual survey of ranges where HRR findings indicated a potential for MEC. The goal of the MEC fieldwork was to determine whether MEC are present on the MRSs. This goal was achieved through the magnetometer-assisted site walk and visual survey.

MC fieldwork included the collection and analysis of various environmental media samples, including surface soil, surface water, and sediment samples, for a select set of metals and explosives, as appropriate based on the HRR findings and agreements made during and after the Technical Project Planning (TPP) meeting. The goal of the MC field activities was to determine the presence or absence of residual MC resulting from activities conducted by the DoD during operation of these sites that may pose a threat to human health and/or the environment. This determination is made by obtaining biased or random surface soil, sediment and surface water samples (when available) and analyzing the samples for MC.

The standard analytical methods include Environmental Protection Agency Methods 6010B and 6020 for metals and United States Environmental Protection Agency (USEPA) Method 8330 for explosives. USEPA Method 6010B was used for the analysis of aluminum, copper, and zinc, and USEPA Method 6020 was used for the analysis of lead and antimony. USEPA Method 6020 was used in lieu of 6010B to achieve the reporting limits consistent with the screening criteria agreed upon at the Technical Project Planning session. All laboratory method detection and reporting limits were set to achieve screening against the following, in the listed order:

- FTSW Inorganic/Metal Background Study (April 2000)
- USEPA Region 9 preliminary remediation goals (PRGs) for residential soil
- Region 4 ecological screening values for surface soil
- USEPA water quality standards for freshwater criterion continuous concentration (CCC) chronic
- Region 4 ecological screening values for surface water

Table ES-1 summarizes the results of the CS activities and recommendations for each MRS.

Table ES-1: CS Findings and Recommendations

<table>
<tr><th rowspan="2">MRS</th><th rowspan="2">CS Recommendation</th><th colspan="2">Basis for Recommendation</th></tr>
<tr><th>MEC</th><th>MC</th></tr>
<tr><td>Anti-Aircraft Range - 1</td><td>Not eligible under the MMRP</td><td colspan="2">Based on the evidence of recent munitions related training observed during the field activities this MRS is not eligible for the MMRP.</td></tr>
<tr><td>Anti-Aircraft Range 90-mm - 2</td><td>RFI/CMS</td><td colspan="2">As agreed upon during the TPP meeting, this MRS is recommended for further investigation (RFI/CMS) based on historical evidence of multiple overlapping range fans and multiple explosive ordnance disposal calls.</td></tr>
<tr><td>Anti-Tank Range 90-mm</td><td>Not eligible under the MMRP</td><td colspan="2">As agreed upon during the TPP meeting, this MRS is not eligible for the MMRP because it is currently being monitored under the RCRA landfill permit. It is recommended that this MRS continue to be monitored under RCRA.</td></tr>
<tr><td>Hand Grenade Course</td><td>Not eligible under the MMRP</td><td colspan="2">Based on information obtained from the Range Control Range Officer, the Hand Grenade Course is located within the footprint of an operational small arms range impact area and as such this MRS is not eligible under the MMRP.</td></tr>
<tr><td>Small Arms Range - 1</td><td>Not eligible under the MMRP</td><td colspan="2">Based on the evidence of recent munitions related training observed during the field activities this MRS is not eligible for the MMRP..</td></tr>
</table>

MRS	CS Recommendation	Basis for Recommendation	
		MEC	MC
Small Arms Range - 3	NFA	Recommend NFA based on historical evidence that only small arms were used on site.	Recommend NFA based on analytical results of soil samples not exceeding the FTSW background values for inorganic compounds. Additionally, the analytical results of sediment and surface water samples did not exceed selected screening criteria.
Hero Road Trench Area	RFI/CMS	As agreed upon during the TPP meeting, this MRS is recommended for further investigation (RFI/CMS) based on information presented in the HRR regarding alleged burials of Chemical Agent Identification Sets Detonation, M1.	

ACKNOWLEDGMENTS

The Confirmatory Sampling (CS) field activities were performed at Fort Stewart (FTSW) from March 13, 2007 to March 15, 2007 and April 30, 2007 by Malcolm Pirnie, Inc., as part of the Military Munitions Response Program (MMRP) for the Department of Defense. The entire CS process began in October 2006 and is scheduled to conclude in late 2007. Malcolm Pirnie, Inc. would like to acknowledge the following people for their participation and cooperation throughout the CS process:

United States Army Environmental Command	Mary Ellen Maly MMRP Program Manager
	Timothy Rodeffer MMRP Project Manager
	Alan Freed Restoration Oversight Manager
United States Army Corps of Engineers	Kimberly Gross FTSW MMRP Site Inspection Project Manager
FTSW	Algeana Stevenson Installation Restoration Program Manager
	Randy Powell-Jones Restoration Manager
Malcolm Pirnie, Inc.	Shelly Kolb Project Manager
	David Smith Deputy Project Manager and Field Team Leader
	Dan Hains Unexploded Ordnance Technician
	Nicole Ukura Field Team
	Marla Miller Project Chemist

1 INTRODUCTION

1.1 MILITARY MUNITIONS RESPONSE PROGRAM OVERVIEW

The Department of Defense (DoD) established the Military Munitions Response Program (MMRP) under the Defense Environmental Restoration Program (DERP) to address unexploded ordnance (UXO), discarded military munitions (DMM), and munitions constituents (MC) located on current and former military installations. Properties classified as operational military ranges, permitted munitions disposal facilities, or operating munitions storage facilities are not eligible for the MMRP, nor are sites that had releases after September 30, 2002. The United States (U.S.) Army's (Army's) inventory of closed, transferred, and transferring military ranges and defense sites has identified sites with munitions and explosives of concern (MEC) (which include both UXO and DMM) and/or MC that are eligible for action under the MMRP.

In late 2003, the Phase 3 Range Inventory was completed for FTSW by Malcolm Pirnie, Inc. A site visit was conducted on October 22 through 24, 2002. The Phase 3 Range Inventory concentrated on the non-operational range areas identified from the Phase 2 Inventory and the surrounding areas to identify CTT ranges (now referred to as MRS). Seven MRSs were identified in the Historical Records Review (HRR) dated May 2006. Descriptions of these sites are provided in Sections 4.1 through 4.7 (more detailed descriptions of these sites are presented in the HRR). Map 2-1 provides an overview of the MRSs.

This report presents the results of the MMRP Resource Conservation and Recovery Act (RCRA) Confirmatory Sampling (CS) conducted at Fort Stewart (FTSW) in Bryan, Evans, Liberty, Long, and Tattnall counties, Georgia (GA), and is intended to meet the requirements of an MMRP Site Inspection (SI) report under the Comprehensive Environmental Response, Compensation, and Liability Act. Malcolm Pirnie is performing the CS on the FTSW installation from February 2006 to October 2007.

The following MMRP eligible sites were investigated as part of this CS:

- Anti-Aircraft Range - 1 (Army Environmental Database - Restoration Identification Number [AEDB-R ID]: FTSW-001-R-01)
- Anti-Aircraft Range 90-millimeter (mm) - 2 (AEDB-R ID: FTSW-002-R-01)

- Anti-Tank Range 90-mm (AEDB-R ID: FTSW-003-R-01)
- Hand Grenade Course (AEDB-R ID: FTSW-004-R-01)
- Small Arms Range - 1 (AEDB-R ID: FTSW-005-R-01)
- Small Arms Range - 3 (AEDB-R ID: FTSW-007-R-01)
- Hero Road Trench Area (AEDB-R ID: FTSW-008-R-01)

1.2 PURPOSE, SCOPE, AND OBJECTIVES

The primary goal of the CS was to collect a sufficient amount of information necessary to make one of the following decisions: 1) whether a RCRA Facilities Investigation (RFI) / Corrective Measures Study (CMS) is required at an Munitions Response Site; 2) whether an immediate response is needed; or 3) whether the MRS qualifies for no further action (NFA). The CS at FTSW addressed MEC and MC on seven ranges for these MMRP eligible sites. The secondary goal of the CS was to collect information for building the MMRP, including Cost-to-Complete (CTC) estimates and site prioritization for the MMRP eligible sites.

The field activities for the CS were not intended to confirm all types of MEC present, determine MEC density, or define the limits of the MEC impacts. The goal of the field sampling activities is to determine if MEC were present or absent at the MRSs and to determine if the MRSs have been impacted by the MC associated with there historical use. The CS field activities were not intended to delineate the nature and extent of MC contamination.

1.3 PROJECT DRIVERS

The key legislative, administrative, and historical precedents for managing MMRP sites include the following:

Defense Environmental Restoration Program (DERP) Management Guidance (September 2001)

The DERP Management Guidance established an MMRP element for UXO, DMM, and MC defense sites. The history of DERP dates back to the Superfund Amendments and Reauthorization Act (SARA) of 1986. The scope of the DERP is defined in 10 United States Code (U.S.C.) §2701(b), which states that the:

> Goals of the program shall include the following: … (1) The identification, investigation, research and development, and cleanup of contamination from hazardous substances, and pollutants and contaminants. (2) Correction of other environmental damage (such as detection and disposal of unexploded ordnance) which creates an imminent and substantial endangerment to the public health or welfare or to the environment.

Army DERP Management Guidance for Active Installations (November 2004)

The Army DERP Management Guidance provides guidance for active installations and non-Base Realignment and Closure (BRAC) excess properties on the management of the Army Installation Restoration Program, the MMRP, and the Building Demolition and Debris Removal Program categories that are related to environmental cleanup. The Army DERP Management Guidance does not apply to Army restoration activities overseas, the BRAC Environmental Restoration Program, the Compliance-Related Cleanup Program, or the Formerly Used Defense Sites Restoration Program. The guidance document was provided to implement the Army's DERP in accordance with the DoD Management Guidance for the DERP (September 2001). The Army DERP Management Guidance supplements the roles, responsibilities, and procedures contained in Army Regulation 200-1 and Department of the Army Pamphlet 200-1.

National Defense Authorization Act (Fiscal Year [FY] 02) (Sections 311-312)

Sections 311-312 of the National Defense Authorization Act of FY02 reinforced the DoD's 2001 DERP Management Guidance by tasking the DoD to develop and maintain an inventory of defense sites that are known or suspected to contain MEC or MC. Section 311 requires the DoD to develop a protocol for prioritizing defense sites for response activities in consultation with the states and Tribes. Section 312 requires the DoD to create a separate program element to ensure that the DoD can identify and track munitions response funding.

The September 2001 DoD Management Guidance for the DERP and the National Defense Authorization Act of FY02, described above, established the MMRP. The DERP and the MMRP provide guidance and methods for conducting a baseline inventory of defense sites containing, or potentially containing, UXO, DMM, or MC.

Munitions Response Site Prioritization Protocol

The Munitions Response Site Prioritization Protocol (MRSPP) reflects the statement in 10 U.S.C. § 2710(b)(2) that the priority assigned should be based on the overall conditions at each location, taking into consideration various factors relating to safety and environmental hazard potential. As required under 10 U.S.C. § 2710(b)(1), the priority assigned to each munitions response site (MRS) will be included with the inventory information made publicly available. The requirement for an inventory of munitions response sites known or suspected of containing unexploded ordnance (UXO), discarded military munitions (DMM), or munitions constituents (MC) is found at 10 U.S.C. § 2710(a). The assigned priority will be updated annually to reflect new information that becomes available.

The Department of Defense first published the MRSPP in the Federal Register as a proposed rule on 22 August 2003. The rule was finalized on 05 October 2005 under the authority of Section 311(b) of the National Defense Authorization Act, codified at Section 10 U.S.C. § 2710(b). The following tables reflect the changes incorporated in the final rule, many of which pertained to clarification of terms and definitions based on new statutory definitions promulgated in the National Defense Authorization Act for 2004 and codified at 10 U.S.C. § 101. The following tables also include the revised module that evaluates potential health hazards associated with MC. This module now has seven potential outcomes (i.e., A through G) rather than the three potential outcomes described in the proposed rule (i.e., high, medium, and low).

2 INSTALLATION OVERVIEW

FTSW consists of 279,081 acres and is located north of Hinesville, GA, approximately 40 miles southwest of Savannah, GA. FTSW is the largest Army installation east of the Mississippi River, spanning portions of Bryan, Evans, Liberty, Long, and Tattnall counties. Georgia Highway 119, which runs north to south from Pembroke to Hinesville, and Georgia Highway 144, which runs east to west from Richmond Hill to Glennville, bisect FTSW. Situated south of Interstate 16 and west of Interstate 95, the installation boundaries are roughly defined by the intersection of Interstate 16 and Interstate 95 and the cities of Richmond Hill, Hinesville, Glennville, Claxton, and Pembroke.

Construction of the reservation that was to become FTSW began on September 10, 1940, on what was formerly the Camp Savannah Anti-Aircraft Firing Center. On November 18, 1940, the reservation's name was changed from Camp Savannah to Camp Stewart in honor of the Revolutionary War Brigadier General Daniel Stewart. The reservation was established as an anti-aircraft center with facilities to prepare artillery troops for overseas deployment.

The reservation's mission of training anti-aircraft units ended on November 20, 1944, and all training terminated in December 1944. Army ground forces units were to have departed by April 30, 1945. A prisoner-of-war camp that was operated at the reservation was also closed. The reservation's mission was reestablished as a separation center for redeployed troops from August 6, 1945, until September 2, 1945. On September 30, 1945, Camp Stewart was inactivated, and the reservation became a location for training the Georgia National Guard. From a peak strength of 55,000 soldiers during the spring of 1944, only two officers, 10 enlisted men, and 50 civilian employees remained by the fall of 1945 to maintain the facilities.

With the outbreak of hostilities in Korea in June 1950, Camp Stewart was reactivated on August 9, 1950, and was designated the 3rd Army Anti-Aircraft Artillery Training Center. In 1953, armor and tank training was added to the mission of the reservation. On March 21, 1956, Camp Stewart was redesignated as Fort Stewart and was designated a permanent Army installation. In

1959, FTSW became an armor and artillery firing center. Troop training at FTSW peaked in 1961 and 1962 in response to the Berlin and Cuban crises, respectively. The 1st Armored Division was relocated to the reservation during the Cuban crisis.

In response to a need for more helicopter and light fixed wing aircraft in support of the Vietnam conflict, an element of the U.S. Army Aviation School at Fort Rucker, Alabama, was transferred to FTSW in 1966. Helicopter pilot training and helicopter gunnery courses became the new mission for FTSW.

In 1967, the main mission for FTSW was to train Army aviators. The reservation was also used to maintain readiness for other active duty, Reserve, and National Guard personnel. In 1970, Vietnamese helicopter pilots began training at FTSW. Aviation training at FTSW was phased out in 1973, when all aviation training was consolidated at Fort Rucker. By 1974, FTSW had become a training and maneuver area, providing tank, field artillery, helicopter gunnery, and small arms training for Regular Army and National Guard units. FTSW supported training by providing facilities, conducting training opportunities, and assisting in the mobilization and deployment of troops.

In 1974, the 1st Battalion, 75th Infantry Regiment (Ranger) was reactivated at FTSW. Later that year, the 24th Infantry Division was activated on the reservation. Currently, the 3rd Infantry Division (Mechanized) (3ID[M]) is the major unit located at FTSW.

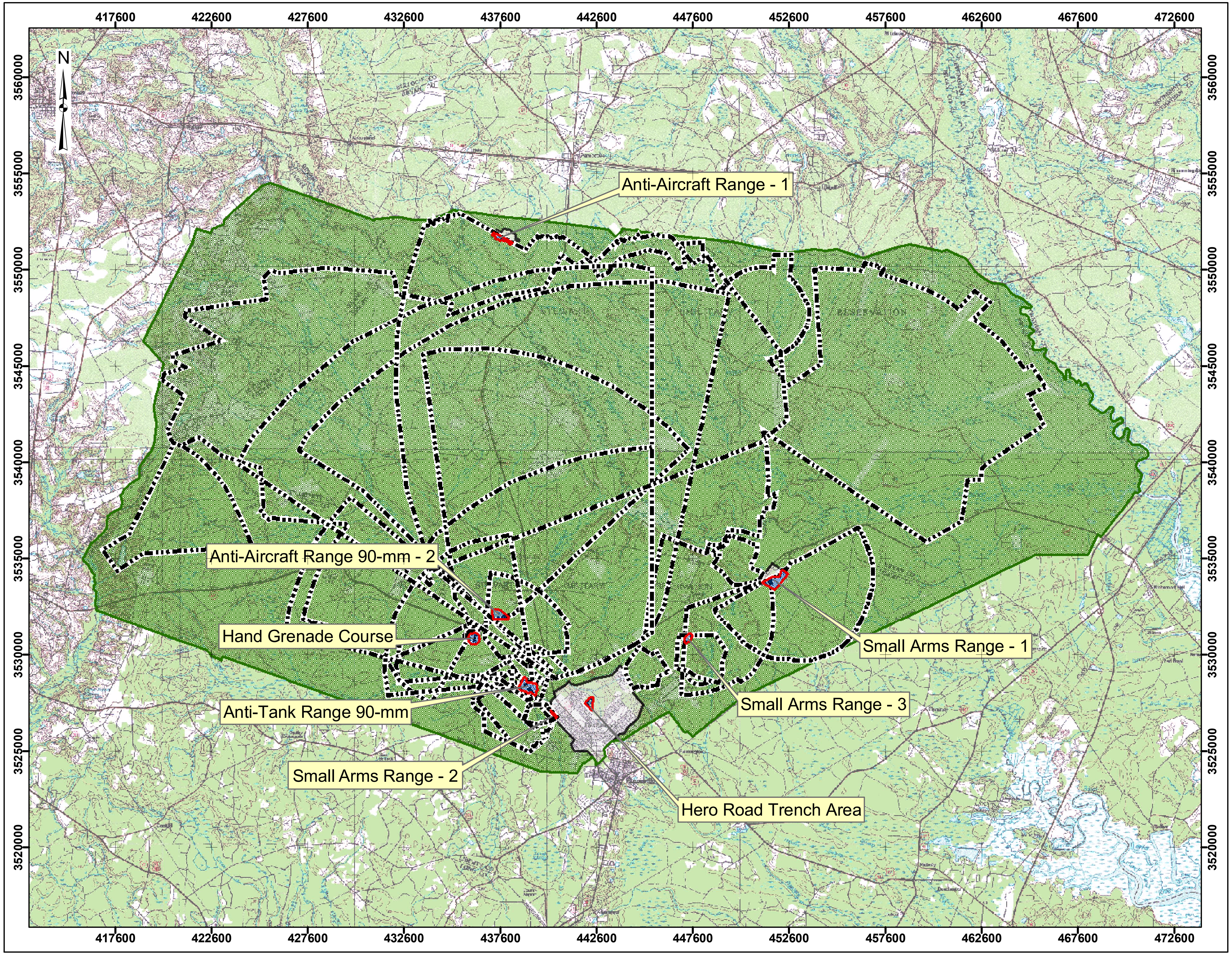
FTSW is the home of the third infantry division (mechanized) (3ID[M]), with the following major units: 1st Brigade, 3ID(M); 2nd Brigade, 3ID(M); 3ID Artillery; 3ID Support Command; 3ID Engineer Brigade; 3/7 Cavalry; 1/3 Air Defense Artillery; 103d Military Intelligence Battalion; 123d Signal Battalion; 3d Military Police Battalion (Provisional); and 24th Corps Support Groups. The 3d Brigade, 3ID(M) operates out of Fort Benning, GA, but often trains at FTSW. Currently, the mission of FTSW is to sustain a quality of life and reservation support at the level necessary for divisions and non-divisional, tenant, and Reserve Component units to accomplish their training missions.

Hunter Army Airfield is a subinstallation to FTSW and is located approximately 45 miles southwest of FTSW. It occupies approximately 5,400 acres and, along with FTSW, acts as a home to the 3ID

2.1 PREVIOUS INVESTIGATIONS

Detailed descriptions of the previous investigations that were conducted at FTSW are presented in the HRR. Based on the data repositories reviewed for the CS, the following additional investigation that contains relevant information and supplements information presented in the HRR at FTSW was identified:

- *Phase II RCRA Facility Investigation Report for 16 Solid Waste Management Units at Fort Stewart, Georgia, Volume I of III* (April 2000)



Confimatory Sampling Report
Fort Stewart, GA

MALCOLM PIRNIE

Map 2-1
Overview of Ranges

Legend

- Installation Boundary
- Munitions Response Site
- Historical Impact Areas

Military Range Area

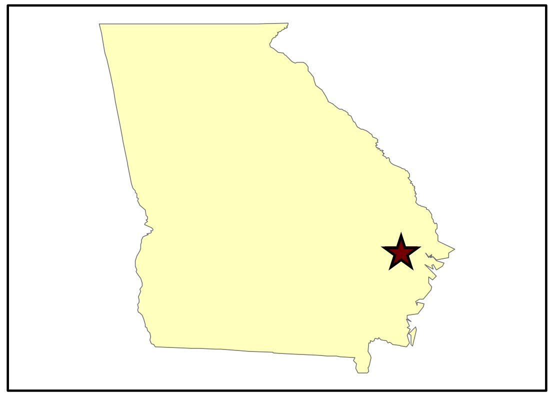
- Operational Range Area
- Non Range, Non UXO-DMM-MC Area

0 2,750 5,500 8,250 11,000 Meters

Data Source: Fort Stewart, GA
USGS Digital Raster Graphics

Coordinate System: UTM Zone 17N
Datum: NAD 83
Units: Meters

Contract: DACA31-00-D-0043
Edition: Final Confimatory Sampling Report
Date: November 2007



3 CONFIRMATORY SAMPLING OVERVIEW

3.1 CONFIRMATORY SAMPLING TASKS

The FTSW CS included both MEC and MC field activities, which were conducted from March 13, 2007, through March 15, 2007, and April 30, 2007, through May 1, 2007. Field activities included locating surface evidence of MEC and munitions debris through instrument-assisted visual surveys and collecting surface soil, surface water, and sediment samples to analyze for MC of concern (aluminum, antimony, copper, lead, zinc, and explosives, where appropriate). The MC were selected based on the types of munitions known to have been used at the MRSs. The purpose of the field activities was to collect sufficient information to determine whether MEC or MC above selected screening criteria are present at each MRS to support one of the following decisions: 1) whether an RFI/CMS is required at an MRS; 2) whether an immediate response is needed; or 3) whether the MRS qualifies for NFA.

Summaries of both the MEC and MC activities conducted at each of the MRSs are provided in Section 4. The MEC and MC activities conducted at each of the MRSs were selected based on results of the Technical Project Planning (TPP) session held on 12 September 2006, and decisions made and agreed upon after the TPP session. The Work Plan, finalized March 2007, dictated both the MEC and MC sampling/field activities conducted at FTSW.

The goal of the MEC field activities at each MRS was to determine if MEC are present on the surface. Due to the potential hazards associated with the presence of MEC, the UXO Technician escorted the field team members during the reconnaissance activities using MEC avoidance techniques. The locations of munitions debris items encountered were documented using a handheld Global Positioning System (GPS). MEC were not encountered at any of the MRSs on FTSW. Additionally, each MEC training related feature or munitions debris encounter was documented in the field logbook (Appendix B). If no items were encountered it was also documented in the field logbook. Observations made during the site walk were used to determine biased soil sampling locations where possible.

The MEC field activities were conducted at the following MRSs:

- Anti-Aircraft Range - 1
- Anti-Aircraft Range 90-mm - 2
- Hand Grenade Course
- Hero Road Trench Area

The goal of the MC field activities was to determine if MC is present at levels potentially posing an unacceptable risk at each MRS. As agreed at the 12 September 2006 TPP session and as described in the Work Plan dated March 2007, MC field activities were conducted at all MRS, with the exception of the Anti-Tank Range 90-mm. Anti-Tank Range 90-mm is currently being managed under the Resource Conservation and Recovery Act (RCRA) program. During the 12 September 2006 TPP session the project stakeholders agreed that the area would continue to be monitored under this program and no further action would be taken under the MMRP. Where possible, samples were collected in biased locations where evidence of munitions related use was observed. An all-metals detector assisted visual survey was conducted to locate remnants of small arms rounds in an attempt to identify biased sample locations. Rationale for each soil sample location is provided in the Soil Sample Logs included in Appendix B. A hand-held GPS unit was used to record all sample locations. Samples were analyzed for metals, and/or explosives using United States Environmental Protection Agency (USEPA) Methods 6010B (aluminum, copper, zinc), 6020 (lead, antimony), 8330 (explosives). Anomaly avoidance techniques were utilized during the MC field sampling activities Table 3-1 and Table 3-2 summarize the TPP decisions that dictated the field activities at FTSW.

Table 3-1: Summary of 12 September 2006 TPP MEC Decisions

MRS	MEC CS Activities	
	Activity	Purpose
Anti – Aircraft Range - 1	Magnetometer assisted visual survey during sampling activities	Support MEC no further action (NFA) or RFI/CMS determination Recommend NFA if no MEC is encountered on the surface Recommend RFI/CMS if MEC is encountered on the surface
Anti – Aircraft Range 90mm - 2	Magnetometer assisted visual survey during sampling activities	Recommend RFI/CMS for MRS based on historical evidence of multiple overlapping range fans and multiple explosive ordnance disposal (EOD) responses.
Anti – Tank Range 90mm	Document historical use in Installation Master Plan	Recommend NFA under the MMRP because current/future use as a RCRA permitted landfill.
Hand Grenade Course	Magnetometer assisted visual survey during sampling activities	Recommend RFI/CMS for MRS based on historical evidence of multiple overlapping range fans.
Small Arms Range - 1	No MEC field activities are required because only small arms were used at the MRS.	
Small Arms Range - 3	No MEC field activities are required because only small arms were used at the MRS.	
Hero Road Trench Area	Conduct a visual survey of unfenced portions of MRS to ensure no MEC or MEC debris remains on the surface.	Recommend RFI/CMS for MRS based on historical evidence and results of current investigation.

Table 3-2: Summary of 12 September 2006 TPP MC Decisions

MRS	MC CS Activities	
	Activity[a]	Purpose[b]
Anti – Aircraft Range - 1	Collect 4 composite surface soil samples Sample locations will be randomly distributed unless biased locations are identified. Analyze for explosives and metals using Environmental Protection Agency (EPA) Methods 8330 and 6010B/6020	Support CTC/Prioritization Protocol. Support MC NFA or RFI/CMS determination. Screen data using: • FTSW Inorganic/Metal Background Study • EPA Region 9 Preliminary Remediation Goal (PRG) for Residential Soil • Region 4 Ecological Screening Values for surface soil
Anti – Aircraft Range 90mm - 2	Collect 1 biased composite surface soil sample at the location of one of the EOD response locations. Analyze for explosives and metals using EPA Methods 8330 and 6010B/6020	Support CTC/Prioritization Protocol. RFI/CMS recommended for MRS based on historical evidence of multiple overlapping range fans and multiple EOD responses. Compare data to: • FTSW Inorganic/Metal Background Study • EPA Region 9 PRG for Residential Soil • Region 4 Ecological Screening Values for surface soil
Anti – Tank Range 90mm	None	Recommend NFA because RCRA permitted landfill is currently being monitored under the RCRA program.
Hand Grenade Range	Collect 1 biased composite surface soil sample in the center of the MRS. Analyze sample for explosives and metals using EPA Methods 8330 and 6010B/6021.	RFI/CMS recommended for MRS based on historical evidence of multiple overlapping range fans.
Small Arms Range - 1	Collect 4 composite surface soil samples collected in the undeveloped portions (~41 acres) of the MRS. Antimony and Lead by EPA Method 6020	Support CTC/Prioritization Protocol. Support MC NFA or RFI/CMS determination. Screen data using: • FTSW Inorganic/Metal Background Study • EPA Region 9 PRG for Residential Soil • Region 4 Ecological Screening Values for surface soil

<table>
<tr><th rowspan="2">MRS</th><th colspan="2">MC CS Activities</th></tr>
<tr><th>Activity[a]</th><th>Purpose[b]</th></tr>
<tr><td>Small Arms Range -3</td><td>Collect 2 sediment, 2 surface water and 3 composite surface soil samples.

Soil samples: 1 in northern and 2 in the southern portions.

Sediment samples: 1 on each of the man-made damns of the pond.

Antimony and Lead by EPA Method 6020</td><td>Support CTC/Prioritization Protocol.

Support MC NFA or RFI/CMS determination.

Screen data using:
• FTSW Inorganic/Metal Background Study
• EPA Region 9 PRG for Residential Soil
• Region 4 Ecological Screening Values for surface soil
• EPA Water Quality Standards for Freshwater Criterion Continuous Concentration (CCC) chronic
• Region 4 Ecological Screening Values for surface water</td></tr>
<tr><td>Hero Road Trench Area</td><td>Collect 1 composite surface soil sample

Explosives and metals using EPA Methods 8330 and 6010B/6020</td><td>Support CTC/Prioritization Protocol.

RFI/CMS recommended for the MRS based on historical evidence and results of current investigation.

Screen data using:
• FTSW Inorganic/Metal Background Study
• EPA Region 9 PRG for Residential Soil
• Region 4 Ecological Screening Values for surface soil</td></tr>
</table>

[a] As per an agreed upon decision made after the TPP meeting, analysis for the full Target Analyte List (TAL) metals list was not conducted. The metals analysis was limited to primary or indicator compounds associated with the munitions history of each MRS. Aluminum, antimony, copper, lead, and zinc were identified as primary or indicator compounds for the munitions associated with the FTSW MRSs, and the metals analysis was limited to these compounds. The primary MC for the munitions items were determined utilizing the U.S. Army Technical Manuals 43-0001-28, 43-0001-29, and 43-0001-30 and the Munitions Items Disposition Action System database created by the Defense Ammunition Center Technology Directorate. For MRSs where historical evidence indicates small arms use only, metals analysis was limited to lead, as agreed upon during the TPP meeting.

[b] As per an agreed upon decision made after the TPP meeting, additional screening values, including ecological soil / surface water and human surface water criteria, were added and are presented.

3.2 DEVIATIONS FROM WORK PLAN

The TPP Meeting Minutes are provided as Appendix H. The details regarding the field sampling procedures are presented in the Final CS Work Plan. Deviations from the procedures described in the work plan during the CS field activities are outlined below:

- Anti-Aircraft Range -1 - due to obstacles including an antennae building and associated structures encountered on the MRS, slight variations in the direct path of the proposed transects were necessary.

- Anti-Aircraft Range 90-mm - 2 – due to operational issues with the GPS unit the location of the former EOD call could not be located therefore the sample was collected randomly within the MRS as the biased location could not be located.
- Hand Grenade Course – the sample collected from this MRS was collected from within the Hand Grenade Course based on field observations of range features. This location was not consistent with the location on the map presented in the CS Work Plan but provided a biased sample that was representative of the conditions on the Hand Grenade Course.
- Small Arms Range 1 – due to site conditions and obstacles including impassably thick underbrush and numerous logs encountered on the MRS, variations in the direct path of the proposed transects were necessary.
- Small Arms Range 3 – all-metals detector assisted visual survey could not be conducted in portions of this MRS due to wetlands and standing water in the northwestern portion of the MRS. The visual survey was conducted in all other areas of the MRS.
- Hero Road Trench Site – magnetometer assisted visual survey was conducted in the area south of the fenced portion of the MRS as proposed in the CS Work Plan. In addition, a magnetometer assisted visual survey was conducted along the fence-line to provide an accurate depiction of the fence-line. The magnetometer assisted visual survey conducted along the fence-line was not consistent with the proposed activities in the CS Work Plan.

3.3 CONFIRMATORY SAMPLING FINDINGS

The results of the CS field activities conducted at FTSW, including MEC and MC findings for each MRS, are discussed in Section 4. The munitions debris items identified, as well as other significant visual observations, were recorded using a Trimble Geoexplorer XT handheld GPS unit. Sampling locations were recorded using the handheld GPS unit and were photo documented; notes regarding each location were written in the Soil Sample Logs. The field notes and observations made during the CS field activities are summarized in Appendix A (Field Notes) and Appendix B (Field Forms and Photographic Log). Analytical results and the quality control data are provided as Appendix C. Geographic coordinates of field observations (including MEC items, munitions debris items, and other notable items), surface water sampling locations, sediment sampling locations, and surface soil sampling locations are provided in Appendix D. The CTC data extraction tables and the MRSPP are included in Appendix E and Appendix F, respectively. The Ordnance Technical Data Sheets are provided in Appendix G. The TPP Meeting Minutes are provided as Appendix H.

FTSW background levels of metals in soils were used as initial screening criteria for MC results. Analytical data were compared to the following criteria:

- FTSW Inorganic/Metal Background Study (April 2000)
- USEPA Region 9 PRGs for residential soil
- Region 4 ecological screening values for surface soil
- USEPA water quality standards for freshwater CCC chronic
- Region 4 ecological screening values for surface water

4 CONFIRMATORY SAMPLING DETAILS

This section presents the site-specific information for each MRS at FTSW. Each MRS subsection includes: a site description and historical overview, an overview of the fieldwork activities that occurred on the MRS, the results of the fieldwork, the conceptual site model (CSM), a site summary, and site recommendations. Analytical tables 4-3, 4-5, 4-11, 4-12, 4-13, and 4-14 include the following:

- FTSW inorganic background values,
- regulatory screening criteria,
- method detection limits,
- laboratory reporting limits, and
- analytical results.

4.1 ANTI-AIRCRAFT RANGE - 1

4.1.1 Site Description and Historical Overview

The MRS layout, location, and approximate sample points are presented on Map 4-1. This MRS is a 42-acre parcel that was overlapped by the buffer area of one historical range fan. The MRS is currently a parade field associated with the Noncommissioned Officer (NCO) Academy located in the northernmost part of the installation. Based on the HRR, it appears that this MRS is located in a downrange buffer area and is not located at a firing point or an impact area. It is assumed that Anti-Aircraft Range - 1 was used continuously from 1957 to 1964. Archival documents from 1941 documenting munitions and weapons allocations confirmed that 37-mm, 40-mm, and 90-mm (M1) anti-aircraft guns were used on FTSW. Based on the range type, period of usage, and the 1941 documents, it is assumed that these munitions were used on Anti-Aircraft Range - 1. No EOD responses have been reported for this MRS. Table 4-3 lists the specific munitions that potentially were used at Anti-Aircraft Range - 1 based on the HRR findings.

4.1.2 Fieldwork Activities

4.1.2.1 MEC Activities and Purpose

Based on information presented in the HRR, the potential exists for MEC at the site; therefore, activities associated with MEC presence were performed, including a magnetometer-assisted surface sweep / visual survey during sampling activities. A magnetometer-assisted site walk was used to determine the presence of MEC on surface at the MRS. Field personnel (escorted by the UXO Technician) executed the magnetometer-assisted surface sweep / visual survey by walking 5-foot-wide transects spaced 40 ft apart (42.5 ft on center accounting for the 5-foot width of the transect) across the MRS. The transects are presented on Map 4-1.

4.1.2.2 MC Activities and Purpose

Two biased and one duplicate composite surface soil samples were collected from the subcaliber rocket range (one from the target berm and one near a tire that was used as a target). Two additional random composite surface soil samples were collected from the parade field. Soil samples were analyzed for aluminum, copper, and zinc (USEPA Method 6010B); lead and antimony (USEPA Method 6020); and explosives (USEPA Method 8330). Data were compared to FTSW inorganic/metal background values, USEPA Region 9 residential PRGs, and Region 4 ecological screening values for surface soil.

4.1.3 Fieldwork Results

4.1.3.1 MEC Results

The UXO Technician used a magnetometer for anomaly avoidance and to aid in the detection of ferrous metal objects on the surface that may have been covered by vegetation. There were no known areas of focus prior to the site walk; however as shown on Map 4-1 a sub-caliber rocket range was identified in the westernmost portion of the MRS. The presence of this range was not identified during the research conducted for the HRR. It is estimated that the sub-caliber rocket range was operational more than ten years ago based on the physical condition of the munitions debris found on the range. In addition, across the entire range there was munitions debris including expended smoke grenades, snap flares, booby trap simulators, and blank small arms cartridges, which based on physical condition are assumed to be less than three years old. No

MEC were observed on the MRS. Figure 4-1 through Figure 4-6 contains photos of the types of munitions debris found at the MRS. Table 4-1 presents the items observed, the associated map item identification name, and item description.

Figure 4-1: Grid layout for surface walk looking towards the Rocket Range (north west)

Figure 4-2: Rocket Range facing west-northwest from the firing berm

Figure 4-3: Expended M18 smoke grenade (Yellow)

Figure 4-4: Expended M125A1 pop flare

Figure 4-5: Expended M-73 subcaliber rockets

Figure 4-6: Subcaliber rocket in tire targets

Table 4-1: Site Discoveries at Anti-Aircraft Range - 1

Map 4-1 Item ID	Description
MEC Item	
None	None
Munitions Debris	
Subcaliber rockets	Rusted launcher tubes of 35-mm subcaliber practice M73 were identified. The UXO Technician estimated the age of these items to be approximately 10 years.
Smoke grenades	The UXO Technician estimated the age of these items to be less than approximately 3 years.
Snap flares	The UXO Technician estimated the age of these items to be less than approximately 3 years.
Booby trap simulators	The UXO Technician estimated the age of these items to be less than approximately 3 years.
Blank small arms cartridges	The UXO Technician estimated the age of these items to be less than approximately 3 years.
Structures/Debris	
Range sign	Sign reading “Phase II Land Nav Day and Night Course”
Surface Features	
Berm	Two 4-foot-tall berms were located on the western portion of the site as part of the sub-caliber rocket range.

4.1.3.2 MC Results

Four composite surface soil samples were collected at Anti-Aircraft Range - 1 and analyzed for aluminum, copper, and zinc by USEPA Method 6010B, lead and antimony by USEPA Method 6020, and explosives by USEPA Method 8330. Two of the composite surface soil samples were collected from biased (FTSW-AA1-03, FTSW-AA1-04) locations on the observed subcaliber rocket range. The other two surface soil samples were collected randomly (FTSW-AA1-05, FTSW-AA1-06) throughout the site. The analytical data are summarized in Table 4-2, and sample locations are shown on Map 4-1. The following are the results of the soil sampling analysis at Anti-Aircraft Range - 1:

- **Lead:** No samples exceed the lead PRG. Three soil samples including a duplicate exceed the background levels and the ecological levels.
- **Other metals:** Aluminum, Antimony, Copper, and Zinc were detected well below background levels.
- **Explosives:** No explosives were detected above method detections or laboratory reporting limits.

Confimatory Sampling Report
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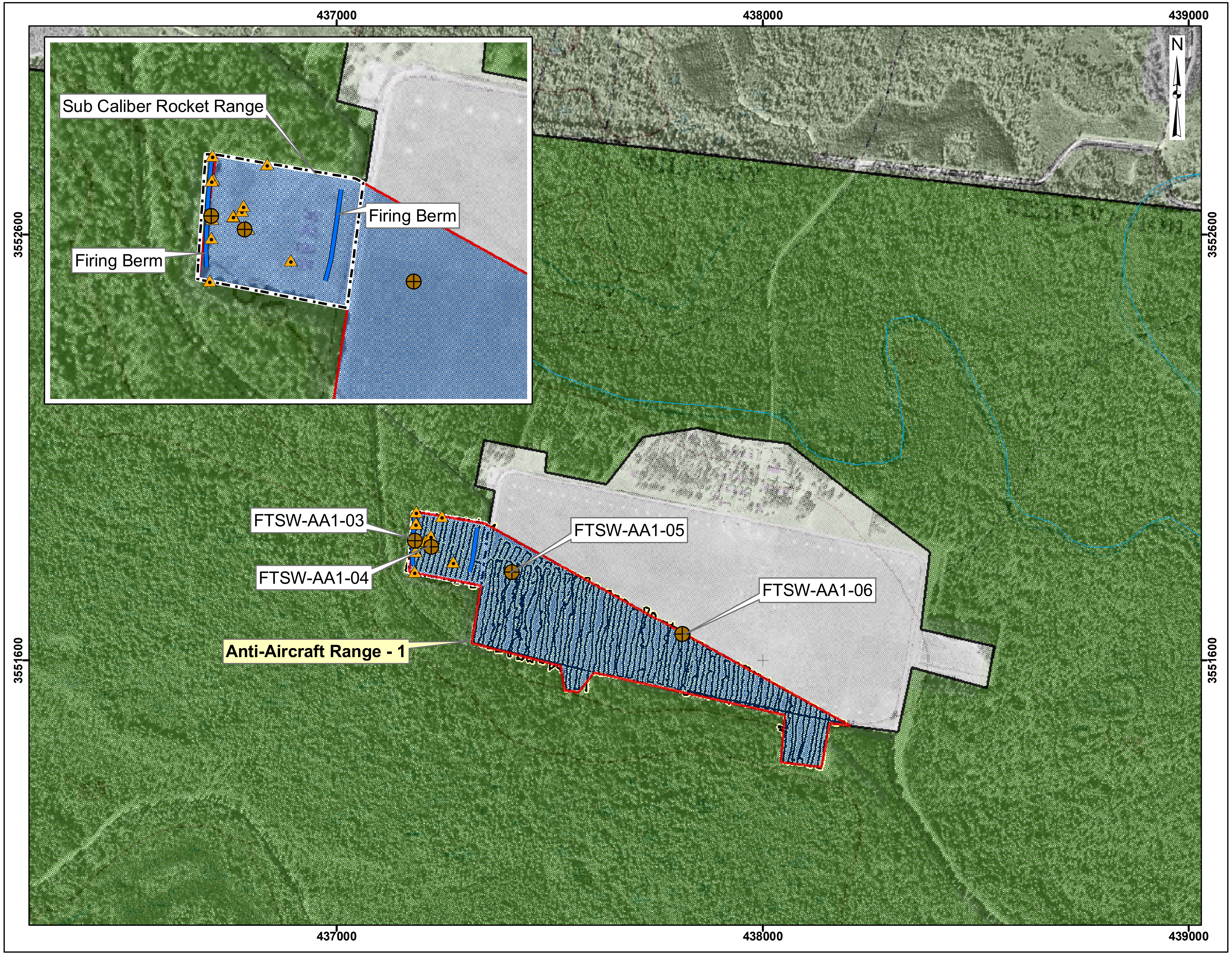
Map 4-1
Anti - Aircraft Range - 1



Legend

- Installation Boundary
- Munitions Response Site
- Streams/Rivers
- Site Reconniassance
- Surface Soil Sample
- Sub Caliber Rockets
- Sub Caliber Rocket Range
- Firing Berm

Military Range Area

- Operational Range Area
- Non Range, Non UXO-DMM-MC Area

0 125 250 375 500 Meters

Data Source: CTT Inventory Data
Microsoft TerraServer
USGS Digital Raster Graphics

Coordinate System: UTM Zone 17N
Datum: WGS 84
Units: Meters

Contract: DACA31-00-D-0043
Edition: Final Confimatory Sampling Report
Date: November 2007

Table 4-2: Anti-Aircraft Range - 1 Analytical Data

Analyte	MDLs mg/kg	Laboratory RLs mg/kg	FTSW[1] Inorganic Metal Background Concentrations mg/kg	EPA Region 9 PRGs mg/kg	Region 4 Ecological Surface Soil Screening Values mg/kg	FTSW-AA1-03	FTSW-AA1-03D	FTSW-AA1-04	FTSW-AA1-05	FTSW-AA1-06
METALS (mg/kg)										
Aluminum	2	10	-	76,000	-	3,100	3,010	2,700	4,790	7,830
Antimony	0.6	3	-	31	-	0.055 (J)	0.030 (J)	0.2	0.074 (J)	0.016 (J)
Copper	0.3	1.5	-	31,000	9	1 (J)	1 (J)	2 (J)	2 (J)	0.8 (J)
Lead	0.3	1.5	11.1	400	2.5	**65.3**	**67.7**	**19.8**	4.8	4.4
Zinc	0.7	3.5	15.5	23,000	120	5	5	12	9	4
EXPLOSIVES (ug/kg)										
1,3,5-TNB	0.05	0.25	N/A[2]	1,800	-	ND	ND	ND	ND	ND
1,3-DNB	0.05	0.25	N/A	6.1	-	ND	ND	ND	ND	ND
2,4,6-TNT	0.03	0.25	N/A	16	-	ND	ND	ND	ND	ND
2,4-DNT	0.04	0.25	N/A	120	20	ND	ND	ND	ND	ND
2,6-DNT	0.05	0.25	N/A	61	-	ND	ND	ND	ND	ND
2-AM-4,6-DNT	0.1	0.5	N/A	-	-	ND	ND	ND	ND	ND
2-NT	0.03	0.25	N/A	180	-	ND	ND	ND	ND	ND
3-NT	0.02	0.25	N/A	180	-	ND	ND	ND	ND	ND
4-AM-2,6-DNT	0.1	0.5	N/A	-	-	ND	ND	ND	ND	ND
4-NT	0.03	0.25	N/A	12	-	ND	ND	ND	ND	ND
HMX	0.04	0.25	N/A	3,100	-	ND	ND	ND	ND	ND
NB	0	1	N/A	20	40	ND	ND	ND	ND	ND
RDX	0.1	0.5	N/A	4.4	-	ND	ND	ND	ND	ND
TETRYL	0.2	1	N/A	16	-	ND	ND	ND	ND	ND

Notes:

(1) Information provided by Phase II RCRA Facility Investigation Report for 16 Solid Wate Management Units At Fort Stewart, GA

(2) NA = Not Applicable

Bold	exceeded FTSW background
(yellow)	exceeded Region 4 Water Screening Values
(cyan)	exceeded Region 4 Ecological Soil Screening Values
(pink)	exceeded EPA Region 9 PRGs for Residential Soil

Definitions:

AM	Amino
C	Carcinogen
DNB	Dinitrobenzene
HMX	High Melting Point Explosive
J	Analyte was positively identified; however, the result should be considered an estimated value
mg/kg	milligram/kilogram
µg/kg	microgram/kilogram
N	Non-carcinogen
NB	Nitrobenzene
NT	Nitrotoluene
RDX	Ciclotrimethylene trinitramine
TETRYL	2, 4, 6, Trinitrophenylmethyinitramine (Explosive)
TNB	Trinitrobenzene
U	Analyte not detected above the reporting limit
UJ	Analyte was not detected above the reporting limit; however, the reporting limit is considered an estimated value.
ND	Analyte not detected above the reporting limit or laboratory reporting limit.

4.1.4 Conceptual Site Model

Based on the evidence of recent munitions related training observed during the field activities this MRS is not eligible for the MMRP, a CSM was therefore not completed.

4.1.5 Site Summary and Conclusions

4.1.5.1 MEC

Based on field observations, both recent (later than 2002) and historical munitions debris are present on this MRS. MEC were not observed on the ground surface and, as such, are not expected to exist at this MRS. Map 4-1 shows the areas covered during the magnetometer-assisted visual survey. Historical munitions debris observed at Anti-Aircraft Range -1 includes subcaliber rockets. Based on the evidence of recent munitions related training activities, it appears that this area is not be eligible for the MMRP, as munitions related training appears to be ongoing on this site.

4.1.5.2 MC

Four surface soil samples were collected from Anti-Aircraft Range - 1 and analyzed for aluminum, copper, zinc, lead, antimony, and explosives. Analytical results indicate that none of the metal concentrations exceeded residential PRGs and no explosive compounds were detected above laboratory detection or reporting limits. With the exception of lead, none of the metals concentrations exceeded the FTSW established inorganic background values or the Region 4 ecological screening values. Established background concentrations for lead on FTSW exceed the Region 4 ecological screening value for surface soil. The lead concentration in one of the samples collected was within the established background levels. The concentrations of lead observed at this MRS were less than an order of magnitude above the established background levels; this is likely indicative of naturally occurring conditions and not evidence of an impact of the former land use.

4.1.6 Site Recommendations

The findings of the MEC CS field activities indicate that MEC are likely not present on Anti-

Aircraft Range 1. Additionally, the observations and analytical results obtained from the CS field activities indicate that an impact from the former land use is unlikely. As a result of the evidence of recent munitions related training observed during field activities the Anti-Aircraft Range - 1 is not eligible for the MMRP.

4.2 ANTI-AIRCRAFT RANGE 90-MM - 2

4.2.1 Site Description and Historical Overview

The MRS layout, location, and sample point are presented on Map 4-2. This MRS is a 77-acre parcel, located northwest of the cantonment area, where two different types of historical munitions uses occurred. These uses included anti-aircraft and tank training and occurred on a total of six separate/collocated ranges from 1941 through 1964. The MRS is positioned in the downrange portion of these ranges and does not overlap impact/target areas or firing points. The known munitions associated with this MRS include 40-mm and 90-mm anti-aircraft projectiles. The munitions used on the tank range are unknown. However, archival documents from 1941 indicate that 37-, 40-, and 90-mm HE and 37-, 40-, and 90-mm practice rounds with tracers were issued to FTSW. Therefore, it is assumed that these munitions could have been used on this MRS. Numerous EOD calls involving C-4 plastic explosives (secondary explosives), M-222 Dragon HE anti-tank guided missiles, M-7 grenades (riot control agent), and MK-2 fragmentation hand grenades were reported on this site. Table 4-4 lists the specific munitions that potentially were used at Anti-Aircraft Range 90-mm - 2 based on the HRR findings.

4.2.2 Fieldwork Activities

4.2.2.1 MEC Activities and Purpose

Based on information presented in the HRR, the potential for MEC at the site was likely. As such a limited magnetometer assisted visual survey, consisting of a five-foot wide path to the sample location, was conducted. No MEC or munitions debris was observed along the path to the sample location. See Map 4-2 for an illustration of the walking path and sampling location. As agreed upon during the TPP session (documented in TPP Meeting Minutes provided in Appendix H) this MRS is recommended for RFI/CMS due to historical evidence of multiple overlapping range fans (Map 2-1) and multiple EOD responses.

4.2.2.2 MC Activities and Purpose

One random composite surface soil sample was collected in order to complete the MRSPP. The soil sample was analyzed for aluminum, copper, and zinc (USEPA Method 6010B); lead and antimony (USEPA Method 6020); and explosives (USEPA Method 8330). Data were compared to FTSW inorganic/metal background values, USEPA Region 9 residential PRGs, and Region 4 ecological screening values for surface soil. This site is recommended for RFI/CMS based on historical evidence of multiple overlapping range fans (Map 2-1) and multiple EOD responses.

4.2.3 Fieldwork Results

4.2.3.1 MEC Results

A limited magnetometer assisted visual survey consisting of a five-foot wide to the sample location, was conducted. No MEC or munitions debris was observed along the path to the sample location.

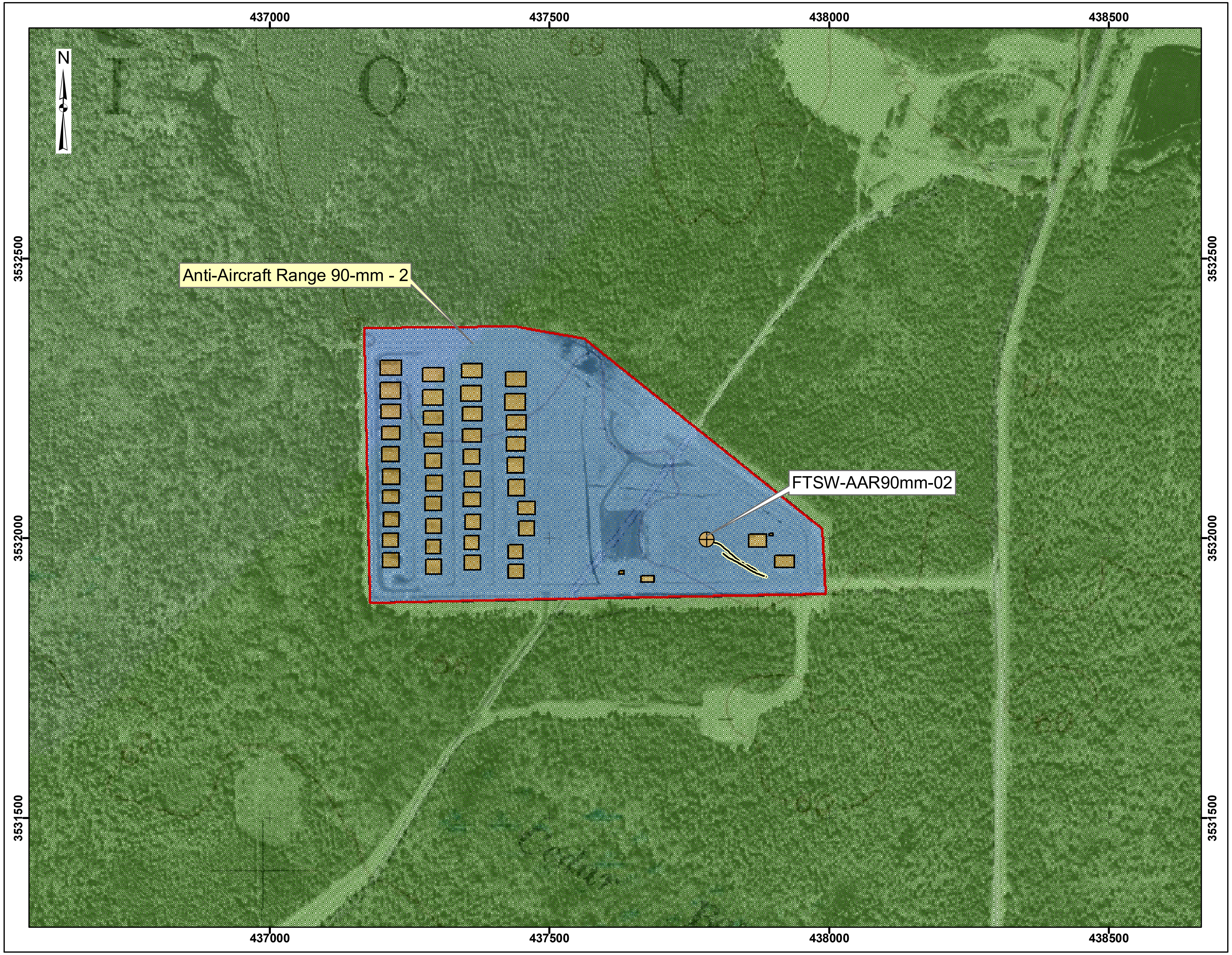
4.2.3.2 MC Results

One composite surface soil sample was collected and was analyzed for aluminum, copper, zinc (USEPA Method 6010B), lead, antimony (USEPA Method 6020), and explosives (USEPA Method 8330) from the Anti-Aircraft Range 90mm – 2 . The analytical data were summarized in Table 4-4, and the sample location is shown on Map 4-2. The results of the soil sampling analysis at the Anti-Aircraft Range 90 mm – 2 indicate that, with the exception of zinc, all metals analyzed were below FTSW established background levels. No explosive compounds were detected above laboratory detection or method reporting limits.

Confimatory Sampling Report
Fort Stewart, GA

MALCOLM PIRNIE

Map 4-2
Anti-Aircraft Range 90-mm - 2



Legend

- Installation Boundary
- Munitions Response Site
- Building
- Site Reconnaissance
- Surface Soil Sample Location

Military Range Area

- Operational Range Area
- Non Range, Non UXO-DMM-MC Area

0 100 200 300 400 Meters

Data Source: CTT Inventory Data
Microsoft TerraServer
USGS Digital Raster Graphics

Coordinate System: UTM Zone 17N
Datum: WGS 84
Units: Meters

Contract: DACA31-00-D-0043
Edition: Final Confirmatory Sampling Report
Date: November 2007

Table 4-3: Anti-Aircraft Range 90-mm - 2

Analyte	MDLs mg/kg	Laboratory RLs mg/kg	FTSW[1] Inorganic Metal Concentrations mg/kg	EPA Region 9PRGs mg/kg	Region 4 Ecological Surface Soil Screening mg/kg	FTSW-AA90MM2-02
METALS (mg/kg)						
Aluminum	2	10	-	76,000	-	3,960
Antimony	0.6	3	-	31	-	0.007 (J)
Copper	0.3	1.5	-	31,000	9	1 (J)
Lead	0.3	1.5	11.1	400	2.5	6.5
Zinc	0.7	3.5	15.5	23,000	120	**25**
EXPLOSIVES (ug/kg)						
1,3,5-TNB	0.05	0.25	N/A[2]	1,800	-	ND
1,3-DNB	0.05	0.25	N/A	6.1	-	ND
2,4,6-TNT	0.03	0.25	N/A	16	-	ND
2,4-DNT	0.04	0.25	N/A	120	20	ND
2,6-DNT	0.05	0.25	N/A	61	-	ND
2-AM-4,6-DNT	0.1	0.5	N/A	-	-	ND
2-NT	0.03	0.25	N/A	180	-	ND
3-NT	0.02	0.25	N/A	180	-	ND
4-AM-2,6-DNT	0.1	0.5	N/A	-	-	ND
4-NT	0.03	0.25	N/A	12	-	ND
HMX	0.04	0.25	N/A	3,100	-	ND
NB	0	1	N/A	20	40	ND
RDX	0.1	0.5	N/A	4.4	-	ND
TETRYL	0.2	1	N/A	16	-	ND

Notes:

(1) Information provided by Phase II RCRA Facility Investigation Report for 16 Solid Wate Management Units At Fort Stewart, GA

Bold	exceeded FTSW background
(yellow)	exceeded Region 4 Water Screening Values
(cyan)	exceeded Region 4 Ecological Soil Screening Values
(pink)	exceeded EPA Region 9 PRGs for Residential Soil

Definitions:

AM Amino
C Carcinogen
DNB Dinitrobenzene
HMX High Melting Point Explosive
J Analyte was positively identified; however, the result should be considered an estimated value
mg/kg milligram/kilogram
µg/kg microgram/kilogram
N Non-carcinogen
NB Nitrobenzene
NT Nitrotoluene
RDX Ciclotrimethylene trinitramine
TETRYL 2, 4, 6, Trinitrophenylmethyinitramine (Explosive)
TNB Trinitrobenzene
U Analyte not detected above the reporting limit
UJ Analyte was not detected above the reporting limit; however, the reporting limit is considered an estimated value.
ND Analyte not detected above the method detection limit or laboratory reporting limit.

4.2.4 Conceptual Site Model

4.2.4.1 MMRP Site Profile

4.2.4.1.1 Area and Layout

The MRS encompasses approximately 77 acres and is located in the southern portion of the installation, approximately 3 miles northwest of the cantonment area. The area within Anti-Aircraft Range 90-mm - 2 is currently developed, with many structures and roads passing through the range.

4.2.4.1.2 Structures

There are 42 buildings and one ammunition supply point on the MRS. There is a fence surrounding the ammunition supply point. The exact locations of these structures are presented on Map 4-2.

4.2.4.1.3 Utilities

The Anti-Aircraft Range 90-mm - 2 site is currently developed, with many buildings and roads passing through the MRS. Specific information on any utilities located at the site is unknown.

4.2.4.1.4 Boundaries

The entire area surrounding Anti-Aircraft Range 90-mm - 2 is undeveloped, heavily wooded, and cut by several trails and unimproved roads.

4.2.4.1.5 Security

Access to the ammunition supply point, which is a portion of the MRS, is restricted by guards and a fence.

4.2.4.2 *Physical Profile*

4.2.4.2.1 Climate

The climate of FTSW is humid subtropical. Temperatures range from an average of 52 degrees Fahrenheit (°F) in January to 81°F in July. The annual precipitation is approximately 48 inches, with slightly over one-half falling from June to September. Average wind speed is from zero to 5 miles per hour (mph), with the prevailing wind direction to the northwest. However, thunderstorms, hurricanes, and tropical storms, occurring most frequently from May through September, produce gusty surface winds with speeds over 5 mph.

4.2.4.2.2 Geology

Known geology of coastal Georgia dates to the Paleozoic epoch and extends to 4000 meters (m) below the ocean surface. The sedimentary section consists of 700 m of Paleozoic rocks of Late Devonian age overlain by 2300 m of Early and Late Cretaceous sediments from the Mesozoic era. Cretaceous rocks are overlain by 100 m of Cenozoic sediments, most of which are Eocene in age.

FTSW is located within the Southern Atlantic Coastal Plain physiographic province. It is characterized by a wedge of gentle, southeast-dipping, clastic sediments that covers crystalline basement rock. The unconsolidated clastic (sand, silt, and clay) sediments thicken in an easterly direction. The basement rocks underlying the sediments dip coastward at about 5.7 m per kilometer from the Fall Line near Macon and Augusta; they appear near the surface in the Savannah area. The basement complex is composed of metamorphic and igneous rocks that range in age from Precambrian to Triassic. The overlying coastal plain sediments are dominated by clastics in the western areas (near the Fall Line) and become more nonclastic near the coast.

No specific geologic information pertaining to this area was available.

4.2.4.2.3 Topography

Most of the installation is flat, with typical elevations of 2 to 30 m above mean sea level (amsl). The northwestern portion is characterized by rolling hills and has elevations from 30 to 55 m.

The topography at Anti-Aircraft Range 90-mm - 2 is gently sloping to the southwest. The ground surface elevation at the site ranges from approximately 70 to 50 ft amsl (USGS, 2007).

4.2.4.2.4 Soil

The most common soil series are Ellabelle loamy sand, Ogeechee, Pelham, Stilson, Rutlege, Leefield, and Mascotte. Most of the soils exhibit a sandy surface layer overlying a subsoil that may be sandy, clayey, loamy, or any combination thereof. The natural soil types range from excessively drained to poorly drained; the poorly drained soil tends to be higher in organic matter than other soils. The excessively drained soil tends to occur at lower elevations in association with swamps. The soil is especially vulnerable to erosion once vegetation has been removed. In coastal Georgia, drainage from three physiographic provinces (the Blue Ridge Mountains, Piedmont Plateau, and Coastal Plain) affects the composition of the alluvial deposits. Near FTSW, the parent material for all soils is water-lain sediments deposited prior to and during the Pleistocene Age.

The soil at Anti-Aircraft Range 90-mm - 2 is classified as sand-silt/sand-clay.

4.2.4.2.5 Hydrogeology

There are three distinct aquifer systems in the FTSW region. The principle artesian aquifer is a deep sequence of limestone of the Eocene to Oligocene age, the primary source of large groundwater withdrawals in the coastal area. This aquifer is generally 92 to 153 m below the surface and is comprised of two different layers. The upper layer is derived from the Oligocene series of sandy, phosphatic limestone and, generally, is not used as a water source. It is underlain by the Ocala Limestone of Eocene age. Primary recharge to the principal aquifer occurs approximately 50 to 90 miles northwest of FTSW, where the rocks composing the aquifer outcrop at the surface. The principal artesian aquifer is overlain by two shallow aquifer systems. A 120- to 150-meter-thick series of Miocene clays, sandy clays, and gravel lies directly above the principal artesian aquifer. The surface aquifer is composed of a relatively thin layer of sands, gravels, and clays. It is recharged directly from rainfall percolating through sediments. It is used almost exclusively as a source for domestic water, but primarily as a secondary water supply rather than for drinking water.

FTSW has its own potable water distribution system. There are 31 groundwater wells located on the installation; five of these are used to supply water through the distribution system to the cantonment area. The cantonment area wells range in depth from 500 to 800 feet and are cased to depths of 400 to 470 feet. The potable water capacity from these five active wells is approximately 10.4 million gallons per day. There are four other active groundwater supply wells located elsewhere on the installation that act as individual water supplies. These wells reportedly range from depths of 500 to 560 feet and are cased to about 400 feet. The remaining 22 wells are distributed across the installation. Of these, two are on standby and the remaining 20 wells are no longer in use.

No specific information about hydrogeologic conditions at the site was available.

4.2.4.2.6 Hydrology

The majority of FTSW is located within the Canoochee River watershed. Most of the surface waters on FTSW drain into the Canoochee River, which passes through the northwestern, central, and southeastern areas of the installation and joins the southward-flowing Ogeechee River. The Canoochee River merges with the Ogeechee River about 35 miles inland from the Ossabaw Sound. The northeastern section of the installation drains directly into the Ogeechee River, and the southwestern section drains into the Altamaha River. The Ogeechee River forms part of the northeastern boundary of FTSW. The remaining surface waters represent a relatively small percentage of the total volume of water leaving the area. In the eastern half of the installation, 60% of the surface area is comprised of marshes and swamps. Four major lakes and ponds are located on FTSW: Pineview Lake, Glissons Pond, Holbrook Pond, and Cantonment Pond. There are no hydrologic features near Anti-Aircraft Range-2.

4.2.4.2.7 Vegetation

On a broad scale, there are four types of ecosystems on FTSW: sand hills, pine flatwoods, upland forests, and wetlands. The installation acreage is made up of approximately 57% upland forest, approximately 29% forested wetlands, and approximately 14% cleared areas. Major tree species found at FTSW include longleaf pine (*Pinus palustris*), slash pine (*Pinus elliottii*), loblolly pine (*Pinus taeda*), tupelo (*Nyssa sylvatica*), other gums (*Nyssa spp.*), water oak (*Quercus nigra*), and bald cypress (*Taxodium distichum*).

This property is developed and has few grasses.

4.2.4.3 Land Use and Exposure Profile

4.2.4.3.1 Current Land Use / Activities

There are 42 buildings and one ammunition supply point on the MRS. Its current use is as an ammunition supply point.

4.2.4.3.2 Current Human Receptors

The current human receptors of potential MEC or MC on Anti-Aircraft Range 90-mm - 2 include authorized installation personnel, contractors, visitors.

4.2.4.3.3 Potential Future Land Use

There is no known change in land use at this time; the potential future land use of Anti-Aircraft Range 90-mm - 2 is assumed to be the same as the current land use (ammunition supply point).

4.2.4.3.4 Potential Future Human Receptors

As there is no known change in land use at this time, the future human receptors of potential MEC or MC remain the same as the current human receptors (authorized installation personnel, contractors, visitors, and trespassers).

4.2.4.3.5 Zoning / Land Use Restrictions

There are no known zoning or access restrictions at FTSW. Site-specific zoning or land use restrictions are unknown.

4.2.4.3.6 Beneficial Resources

General information about the beneficial resources on FTSW is presented in Section 4.1.4.3.6. There are no known site-specific beneficial resources.

4.2.4.3.7 Demographics/Zoning

According to the 2000 U.S. Census, the population at FTSW was 11,205. The city of Hinesville, which is located at the southern boundary of FTSW, has a population of 30,392 according to the 2000 U.S. Census. The city of Savannah, located northeast of FTSW, has a population of 131,510.

4.2.4.4 Ecological Profile

4.2.4.4.1 Habitat Type

General information on habitat types at FTSW is provided in Section 4.1.4.4.1. Anti-Aircraft Range 90-mm - 2 is developed, consisting of buildings and paved or landscaped areas. The site is adjacent to a wooded area with deciduous trees.

4.2.4.4.2 Degree of Disturbance

The current degree of disturbance at the Anti-Aircraft Range 90-mm - 2 is moderate to high, as the area is largely developed.

4.2.4.4.3 Ecological Receptors

FTSW has a large portion of forested property and wetlands; therefore, it serves as a habitat for the many animals and fish that reside on FTSW. Based the fact that the site is particularly developed and fenced, the ecological diversity is low.

4.2.4.5 Munitions/Release Profile

4.2.4.5.1 Munitions Types and Release Mechanisms

Table 4-4 presents a summary of the types of munitions debris and MEC that are expected to exist at the Anti-Aircraft Range 90-mm – 2 based on information collected for the HRR and EOD records.

Table 4-4: Summary of Potential and Actual Munitions Debris and MEC – Anti-Aircraft Range 90-mm - 2

MRS	Munitions Debris / MEC Observed During CS Field Activities	Munitions Debris / MEC Identified During HRR	Primary Release Mechanism
Anti-Aircraft Range 90-mm – 2	No MEC or munitions debris were observed along the five-foot wide path to the sample location.	C-4 plastic explosives MK-2 fragmentation grenades M-7 grenades M-222 and Dragon guided missiles (ground) 37-mm HE M54, 40-mm, 40-mm HEP, 90-mm, 90-mm HE, and 90-mm M71 HE projectiles	Hand thrown Munitions firing Malfunctioned munitions Discarded munitions

4.2.4.5.2 Maximum Probable Penetration Depth

Table 4-5 provides the expected penetration depths for MEC for various types of soils that are expected to be found at Anti-Aircraft Range 90-mm - 2 (USACE, Engineering Manual 1110-1-4009 *Ordnance and Explosives Response*). For Anti-Aircraft Range 90-mm - 2, the soil type is considered sand-silt/sand-clay. Therefore, the depths of penetration for this MRS are based upon the penetration depth for a loamy soil. As discussed in Section 4.1.4.5.2, these penetration depths are estimated on a worst-case scenario. Anti-Aircraft Range 90-mm - 2 was developed after its use as a range. The site was filled and graded during the construction of the ammunition supply point. Thus, the depths to MEC may not be representative of the depths presented in Table 4-5, and MEC could be encountered at any depth within the construction or fill areas.

Table 4-5: Summary of Expected MEC Penetration Depths – Anti-Aircraft Range 90-mm - 2

Ordnance Item/Weapon	Depth of Penetration (ft bgs)		
	Sand	Loam	Clay
MK-2 fragmentation grenades M-7 grenades	0.0	0.0	0.0
M-222 and Dragon guided missiles (ground)	9.0	1.0	7.0
37-mm projectiles	3.9	5.2	7.9
40-mm and 40-mm HEP projectiles	0.2	0.3	0.4
90-mm, 90-mm HE, and 90-mm M71 HE projectiles	0.0	7.0	1.0

4.2.4.5.3 MEC Density

A limited magnetometer assisted visual survey of a five-foot wide lane was conducted along the path to the sampling location. No MEC or munitions debris was observed along the path to the sample location. The majority of the area appeared to be developed so it is unlikely that MEC will be found on the surface. MEC density on the surface is expected to be low due to the amount of the site that has been developed; MEC density is unknown in the subsurface.

4.2.4.5.4 Munitions Debris

A limited magnetometer assisted visual survey of a five-foot wide lane was conducted along the path to the sampling location. No MEC or munitions debris was observed along the path to the sample location. However, there is potential for munitions debris items because; the EOD has responded to several emergency calls in the area. Previously, they have encountered MK-2 fragmentation hand grenades, M-7 grenades, C-4 plastic explosives, and M-222 and GM Dragon missiles.

4.2.4.5.5 Associated MC

Associated MC from MK-2 hand grenades include TNT and minimal black powder (potassium nitrate, sulfur, and charcoal) in the fuse. Potential MC associated with M-7 grenades include Octol (cyclotetramethylenetetranitramine [HMX] and TNT). Potential MC associated with M-

222 and Dragon guided missiles include Octol, perchlorate, pyrotechnic smoke, and a tearing agent. Potential MC associated with 37-mm, 40-mm, 40-mm HEP, 90-mm, 90-mm HE, and 90-mm M71 HE projectiles include Tetryl, CMP AB, and TNT. Ordnance Technical Data Sheets are in Appendix G.

One composite soil sample was collected within the boundary of Anti-Aircraft Range 90-mm - 2. The sample was analyzed for metals, including aluminum, copper, and zinc (USEPA Method 6010B); lead and antimony (USEPA Method 6020); and explosives (USEPA Method 8330). Based on the analytical results, the soil sample exceeds FTSW background values and Region 4 Ecological Soil Screening values for zinc. No explosive compounds were detected above laboratory detection or reporting limits.

4.2.4.5.6 Transport Mechanisms / Migration Routes

The primary transport mechanisms identified for Anti-Aircraft Range 90-mm - 2 include:

Erosion: Anti-Aircraft Range 90-mm - 2 is a heavily developed area; therefore, erosion is not expected in this area and is not a factor in transporting and migrating possible MC contaminated soil.

Soil Disturbance: The current degree of disturbance is relatively high, as the area has been developed and cleared since the range was used. Future development could unveil potential MC that are in the subsurface.

Infiltration: Based on the soil types associated with Anti-Aircraft Range 90-mm - 2, the potential exists for MC to migrate from one environmental medium to another (surface to subsurface soil to groundwater) through filtration.

4.2.4.6 Pathway Analysis

4.2.4.6.1 MEC

Based on the historical use of the site as a 90-mm anti-aircraft range fan, the potential exists for

MEC to be present on the site. Although there were no MEC or munitions debris observed while walking to the sampling location, the historical use of the site indicates MEC may be present at the site within undeveloped areas on the surface or in former excavations used in training activities. It is unlikely for MEC to be present on the surface of the developed portion of the MRS as the site is currently an ammunition supply point and is well maintained (mowed). As illustrated in the Exposure Pathway Analysis for MEC (Figure 4-7), the pathway for all human and ecological receptors are potentially complete as there is potential for these receptors to encounter MEC on the surface. Since MEC density in the subsurface is unknown, potentially complete pathways for installation personnel, contractors, and biota for MEC in the subsurface may exist as these receptors have the potential to conduct intrusive activities. The pathway for MEC in the subsurface is incomplete for all other receptors.

4.2.4.6.2 MC

As illustrated in the MC Exposure Pathway Analysis (Figure 4-8), soil and groundwater represent the potential primary source media. One surface soil samples collected within the boundary of Anti-Aircraft Range 90-mm – 2 was analyzed for aluminum, copper, and zinc by USEPA Method 6010B, lead and antimony by USEPA Method 6020, and explosives by USEPA Method 8330. Analytical results indicate no explosives were detected and no metals exceeded regulatory PRGs. Zinc was found at a concentration that exceeds background and the ecological values but not PRGs.

Food Chain

A potentially complete pathway to MC in the source media through uptake into vegetation exists for grazing/foraging biota. This exposure pathway is incomplete for all other receptors as there are no agricultural activities on this MRS. As there are no domestic animals on FTSW and only ecological screening values were exceeded, the pathway to MC in the source media through this exposure route is incomplete for all human receptors. The pathway to MC in the source media through the game/fish/prey exposure route is potentially complete for biota. This exposure pathway is incomplete for all other receptors as hunting is not permitted in this area.

Groundwater

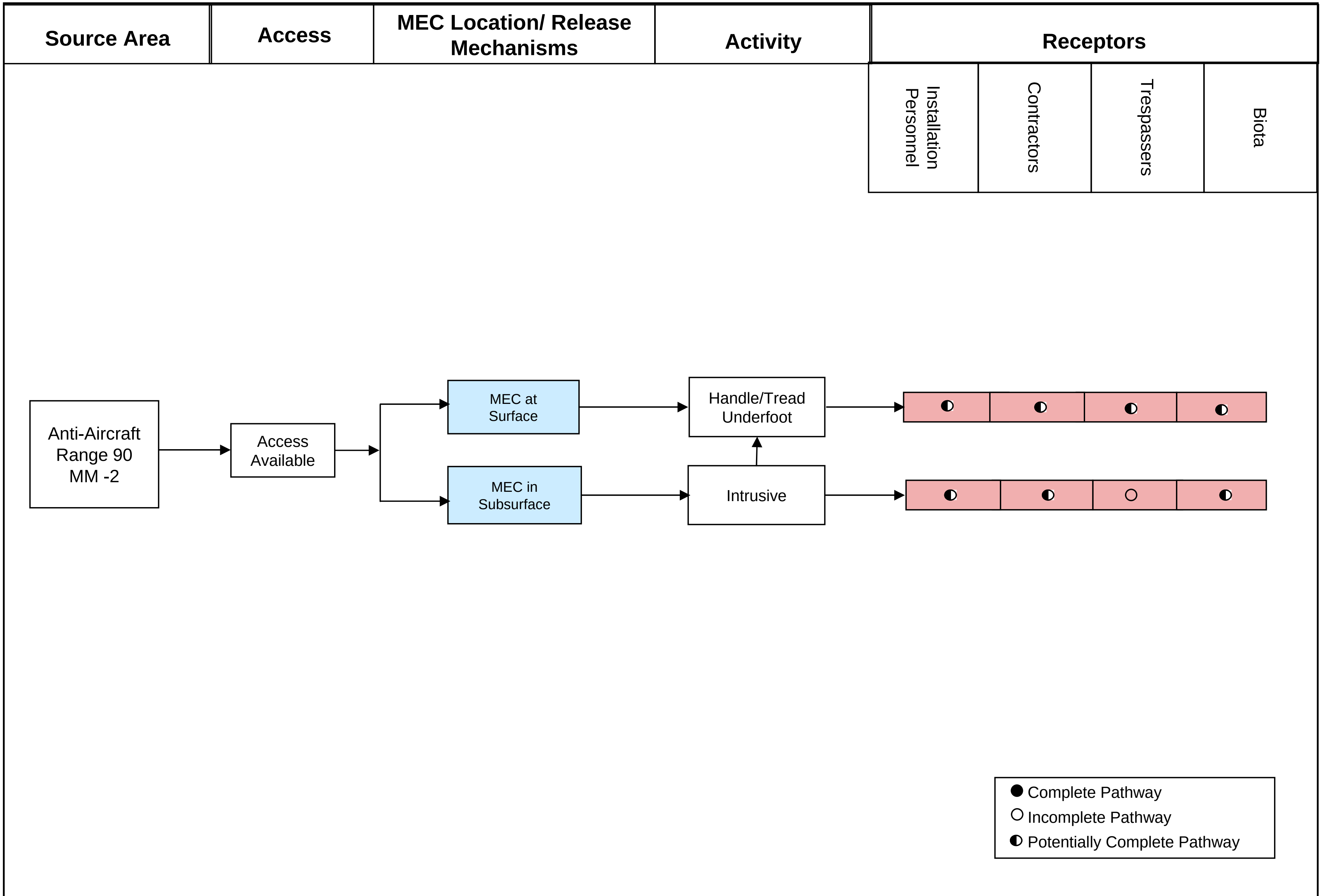
Precipitation infiltration may provide for contaminant mobility into the shallow or surficial groundwater aquifer. However, based on a review of hydrogeological data (Section 4.2.4.2.5), it is unlikely that MC in shallow groundwater would migrate to the deeper aquifers that are used as a water supply for FTSW. Receptor contact with groundwater is possible if the soil is disturbed through excavation or construction activities, creating possible migration routes/mechanisms for MC in shallow groundwater. However since only ecological screening limits were exceeded only biota have potentially complete pathways to MC in subsurface soil and/or shallow groundwater through the (incidental) ingestion and dermal contact exposure routes.

Subsurface Soil

The potential exists for MC in the subsurface soil in the Anti-Aircraft Range 90-mm – 2 area however only at concentrations exceeding ecological screening limits. Ecological receptor contact with subsurface soil is possible during burrowing activities, creating possible receptor pathways to MC in subsurface soils. As such, biota have potentially complete pathways to MC in subsurface soil through the (incidental) ingestion, dermal contact, and inhalation (dust) exposure routes. All human exposure routes are incomplete based on analytical results.

Surface Soil

Based on the sampling data presented above, exposure pathways via surface soil are considered incomplete for human receptors based on analytical results. Ecological receptors within the Anti-Aircraft Range 90-mm – 2 area may be exposed to zinc in the surface soil. Therefore, the pathways to MC in surface soil through the (incidental) ingestion, dermal contact, and inhalation of dust exposure routes are potentially complete for biota.



MALCOLM PIRNIE

Prepared for:

USACE Baltimore

CONFIRMATORY SAMPLING REPORT

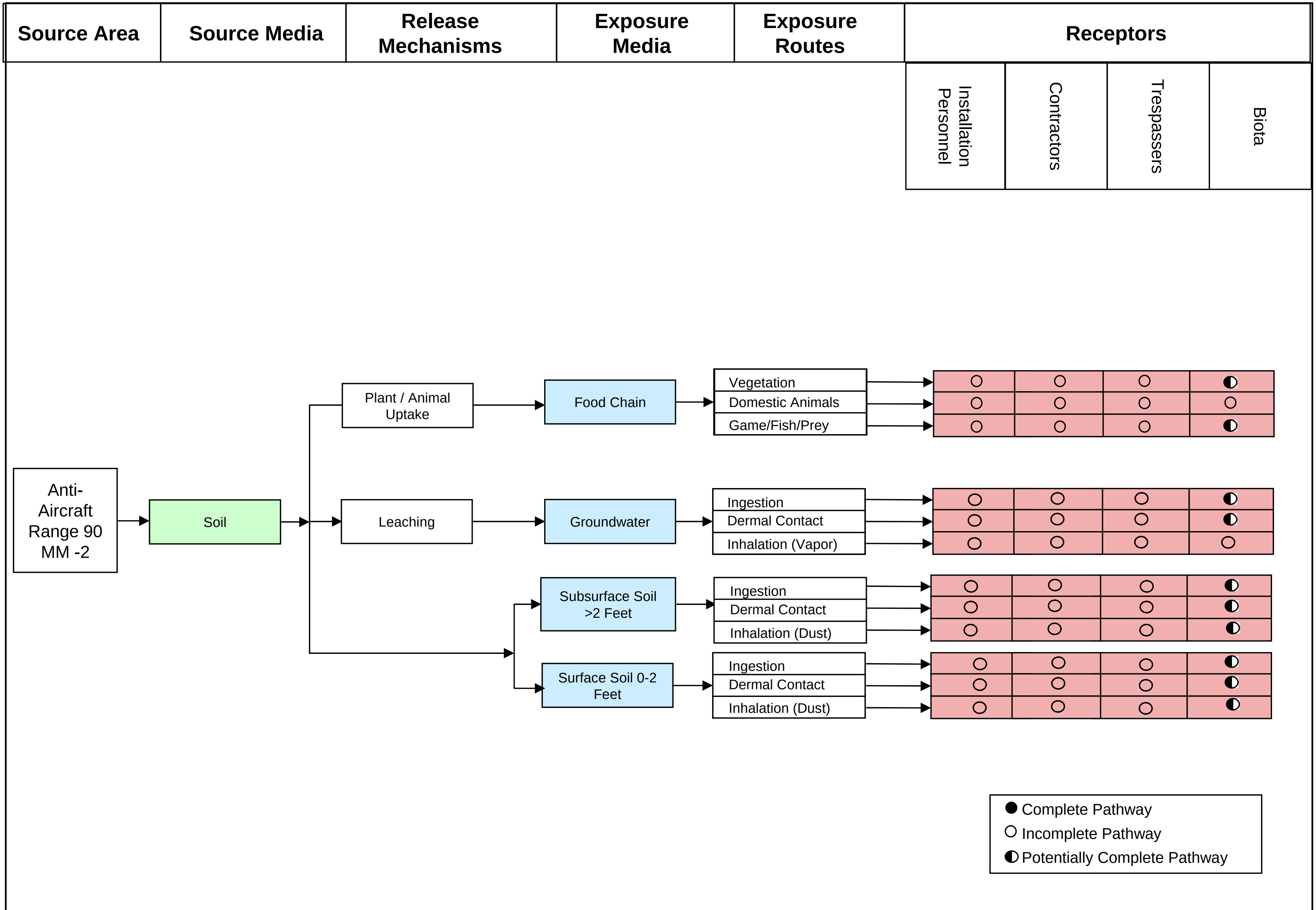
ANTI-AIRCRAFT RANGE 90 MM - 2– MEC EXPOSURE PATHWAY ANALYSIS

FORT STEWART, GEORGIA

MALCOLM PIRNIE, INC.

FIGURE 4-7

November 2007



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Prepared for:

USACE Baltimore

CONFIRMATORY SAMPLING REPORT
ANTI-AIRCRAFT RANGE 90 MM - 2– MC EXPOSURE PATHWAY ANALYSIS
FORT STEWART, GEORGIA

MALCOLM PIRNIE, INC.

FIGURE 4-8
November 2007

4.2.5 Site Summary and Conclusions

4.2.5.1 MEC

A limited magnetometer assisted visual survey of a five foot wide lane was conducted along the short path to the sampling location. No MEC or munitions debris was observed along the path to the sample location. It is unlikely for MEC to be present on the surface of the developed portion of the MRS as the site is currently an ammunition supply point and is well maintained (mowed). However, based on historical evidence MEC may be present in the undeveloped portions of the site.

4.2.5.2 MC

One composite surface soil sample was collected and analyzed for aluminum, copper, zinc, lead, antimony, and explosives from the Anti-Aircraft Range 90mm – 2 in order to complete the MRSPP. Based on the results of the metals analysis, the sample exceeded the Region 4 ecological screening value for lead in surface soil, but was within the FTSW established background value for lead. No other metals were detected in concentrations exceeding regulatory screening values. No explosive compounds were detected above laboratory detection or reporting limits.

4.2.6 Site Recommendations

As agreed upon during the TPP session (documented in the TPP Meeting Minutes provided in Appendix H), this site is recommended for RFI/CMS due to historical evidence of multiple overlapping range fans (Map 2-1) and multiple EOD responses.

4.3 ANTI-TANK RANGE 90-MM

4.3.1 Site Description and Historical Overview

The MRS layout and location are presented on Map 4-3. This MRS is a 124-acre parcel that had three overlapping historical munitions uses and is currently an active landfill west of the cantonment area. The MRS is located near the firing points of a former 90-mm anti-tank range and a former 40-mm anti-aircraft range. The MRS is also positioned within the downrange buffer area of a small arms range. The period of usage of the 90-mm anti-tank range and the 40-mm anti-aircraft range could have been from 1941 through 1947. The history of FTSW implies that this type of training likely ceased in 1944. Based on the research conducted, the small arms ranges were in operation from 1941 through 1971. However, small arms use only overlapped this MRS in 1941. The known munitions associated with this MRS include 40-mm anti-aircraft projectiles and 90-mm anti-tank projectiles. According to documents reviewed for the HRR, munitions used on the small arms range were .50-caliber (cal) or less; however, the exact caliber is unknown. No EOD responses have been reported for this MRS. Map 4-3 shows the Anti-Tank Range 90-mm MRS.

4.3.2 Fieldwork Activities

4.3.2.1 MEC Activities and Purpose

No MEC field activities were conducted on the Anti-Tank Range 90-mm MRS because of the MRS's current and future anticipated use as a RCRA permitted landfill. It was recommended that the historical use of this area be documented in the Installation Master Plan and that the site continue to be monitored under the RCRA program.

4.3.2.2 MC Activities and Purpose

No MC field activities were planned for the Anti-Tank Range 90-mm MRS because of the MRS's current and future anticipated use as a RCRA permitted landfill. It was recommended that the historical use of this area be documented in the Installation Master Plan.

4.3.3 Fieldwork Results

No MEC and MC field activities were conducted on the Anti-Tank Range 90-mm MRS because of the MRS's current and future anticipated use as a RCRA permitted landfill.

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Map 4-3
Anti-Tank Range 90mm

Legend

Munition Response Site/ RCRA Landfill Boundary
Streams/Rivers
Lake or Pond
Stream or River

Military Range Area

Operational Range Area
Non Range, Non UXO-DMM-MC Area

0 100 200 300 400Meters

Data Source: CTT Inventory Data
Microsoft Terra Server
USGS Digital Raster Graphics

Coordinate System: UTM Zone 17N
Datum: WGS 84
Units: Meters

Contract: DACA31-00-D-0043
Edition: Final Confirmatory Sampling Report
Date: November 2007

4.3.4 Conceptual Site Model

Because of the MRS's current and future anticipated use as a RCRA permitted landfill, a CSM was not completed.

4.3.5 Site Summary and Conclusions

No MEC or MC field activities were conducted at the Anti-Tank Range 90-mm because of the MRS's current and future anticipated use as a RCRA permitted landfill. This MRS is not MMRP eligible and therefore a CSM was not created. It is recommended that the historical use of this area be documented in the Installation Master Plan.

4.3.6 Site Recommendations

NFA under the MMRP is recommended for the Anti-Tank Range 90-mm. It is recommended that this site continue to be monitored as part of the landfill under the RCRA program. Additionally, it is recommended that the historical use of this area be documented in the Installation Master Plan.

4.4 HAND GRENADE COURSE

4.4.1 Site Description and Historical Overview

The MRS layout, location, and sample location are presented on Map 4-4. This MRS is a 67-acre undeveloped parcel and is located in an isolated area of the installation, northwest of the cantonment area. Four different types of historical munitions uses occurred from 1941 through 1994 on five different overlapping ranges. These uses included 40-mm anti-aircraft, 90-mm anti-tank, hand grenade, and small arms training. The MRS is located near the firing point of the active small arms range and in the downrange portions of a 40-mm anti-aircraft range and a 90-mm anti-tank range. The MRS is almost completely overlapped by the footprint of the hand grenade course. The known munitions associated with this MRS include 40-mm anti-aircraft projectiles, 90-mm anti-tank projectiles, small arms, and hand grenades. The exact caliber of small arms use is unknown.

4.4.2 Fieldwork Activities

4.4.2.1 MEC Activities and Purpose

Based on information presented in the HRR, the potential for MEC at the site was likely. As such, a limited magnetometer-assisted visual survey, consisting of a five-foot wide path to the sample location, was conducted. No MEC or munitions debris was observed along the path to the sample location. See Map 4-4 for an illustration of the walking path and sampling location. As agreed upon during the TPP session (documented in TPP Meeting Minutes provided in Appendix H) this MRS is recommended for RFI/CMS due to historical evidence of multiple overlapping range fans (Map 2-1) and multiple EOD responses.

4.4.2.2 MC Activities and Purpose

One random composite surface soil sample was collected on this MRS in order to complete the MRSPP. The soil sample was analyzed for aluminum, copper, and zinc (USEPA Method 6010B); lead and antimony (USEPA Method 6020); and explosives (USEPA Method 8330). Data were compared to FTSW inorganic/metal background values, USEPA Region 9 residential PRGs, and Region 4 ecological screening values for surface soil. This site is recommended for RFI/CMS based on historical evidence of multiple overlapping range fans (Map 2-1) and its historical use as a hand grenade range.

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4.4.3 Fieldwork Results

4.4.3.1 MEC Results

A limited magnetometer assisted visual survey consisting of a five-foot wide to the sample location, was conducted. No MEC or munitions debris was observed along the path to the sample location.

4.4.3.2 MC Results

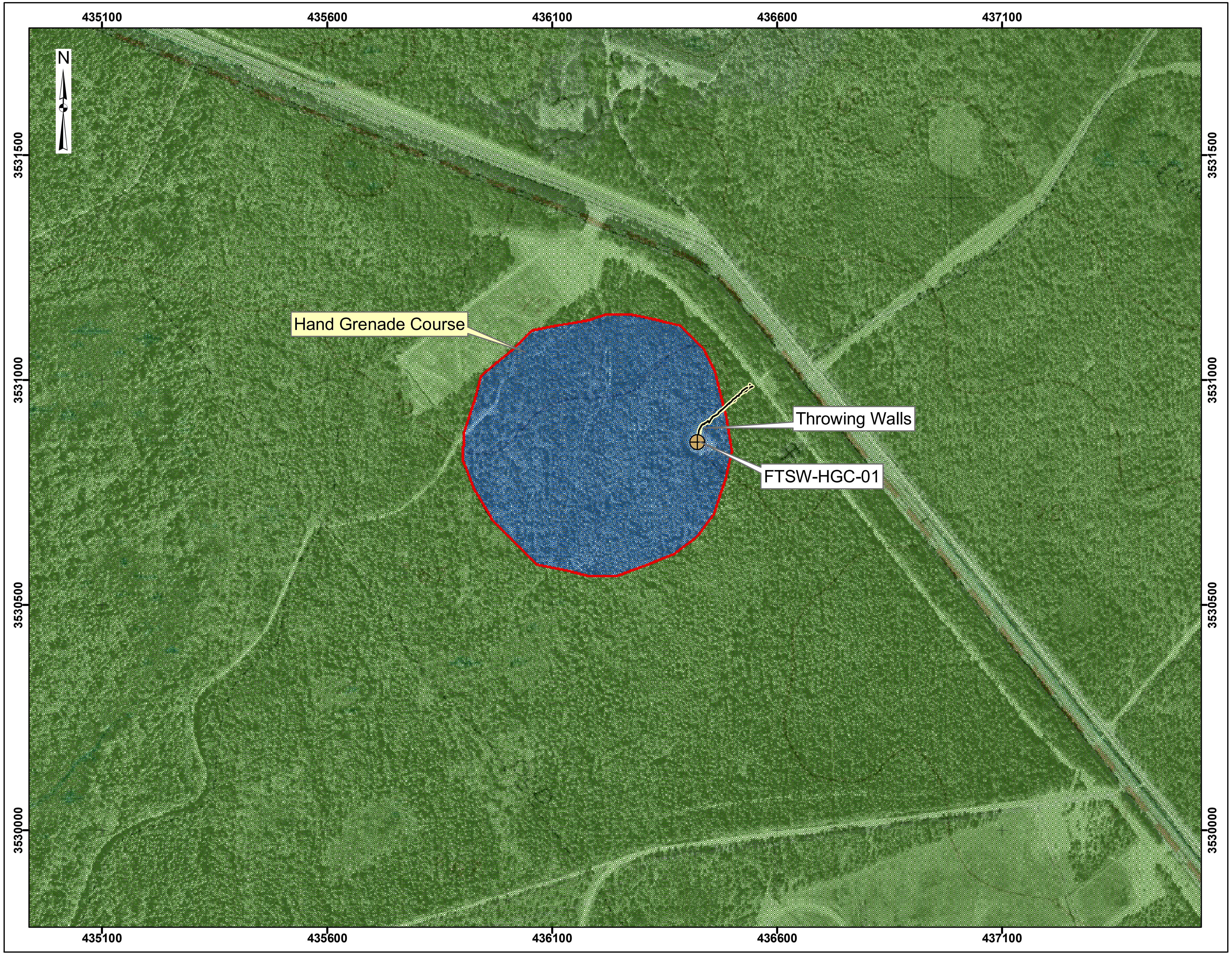
One soil sample was collected from the Hand Grenade Course and analyzed for aluminum, copper, and zinc (USEPA Method 6010B); lead and antimony (USEPA Method 6020); and explosives (USEPA Method 8330). The analytical data are summarized in Table 4-6, and sample locations are shown on Map 4-4.

The following are the results of the soil sampling analysis at the Hand Grenade Course:

- **Lead:** The sample did not exceed the residential PRG for lead. The sample exceeded the FTSW established background level for lead and the Region 4 ecological screening value for lead in surface soil.

- **Other metals:** The sample exceeded the FTSW established background levels for lead and zinc. The Region 4 ecological screening value for copper, and zinc was also exceeded.

- **Explosives:** No explosives were detected above laboratory detection or method reporting limits.



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Map 4-4
Hand Grenade Course

Legend

- Installation Boundary
- Munitions Response Site
- Site Reconnaissance
- Surface Soil Sample Location

Military Range Area

- Operational Range Area
- Non Range, Non UXO-DMM-MC Area

0 125 250 375 500 Meters

Data Source: CTT Inventory Data
Microsoft TerraServer
USGS Digital Raster Graphics

Coordinate System: UTM Zone 17N
Datum: WGS 84
Units: Meters

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Edition: Final Confimatory Sampling Report
Date: November 2007

Table 4-6: Hand Grenade Course Analytical Tables

Analyte	MDLs mg/kg	Laboratory RLs mg/kg	FTSW[1] Inorganic Metal Concentra mg/kg	EPA Region 9PRGs mg/kg	Region 4 Ecological Surface Soil mg/kg	FTSW-HGC-01
METALS (mg/kg)						
Aluminum	2	10	-	76,000	-	15,000
Antimony	0.6	3	-	31	-	0.011 (J)
Copper	0.3	1.5	-	31,000	9	16.0
Lead	0.3	1.5	11.1	400	2.5	**12.5**
Zinc	0.7	3.5	15.5	23,000	120	**175**
EXPLOSIVES (ug/kg)						
1,3,5-TNB	0.05	0.25	N/A[2]	1,800	-	ND
1,3-DNB	0.05	0.25	N/A	6.1	-	ND
2,4,6-TNT	0.03	0.25	N/A	16	-	ND
2,4-DNT	0.04	0.25	N/A	120	20	ND
2,6-DNT	0.05	0.25	N/A	61	-	ND
2-AM-4,6-DNT	0.1	0.5	N/A	-	-	ND
2-NT	0.03	0.25	N/A	180	-	ND
3-NT	0.02	0.25	N/A	180	-	ND
4-AM-2,6-DNT	0.1	0.5	N/A	-	-	ND
4-NT	0.03	0.25	N/A	12	-	ND
HMX	0.04	0.25	N/A	3,100	-	ND
NB	0	1	N/A	20	40	ND
RDX	0.1	0.5	N/A	4.4	-	ND
TETRYL	0.2	1	N/A	16	-	ND

Notes:

(1) Information provided by Phase II RCRA Facility Investigation Report for 16 Solid Wate Management Units At Fort Stewart, GA

Bold	exceeded FTSW background
	exceeded Region 4 Water Screening Values
	exceeded Region 4 Ecological Soil Screening Values
	exceeded EPA Region 9 PRGs for Residential Soil

Definitions:

AM Amino
C Carcinogen
DNB Dinitrobenzene
HMX High Melting Point Explosive
J Analyte was positively identified; however, the result should be considered an estimated value
mg/kg milligram/kilogram
µg/kg microgram/kilogram
N Non-carcinogen
NB Nitrobenzene
NT Nitrotoluene
RDX Ciclotrimethylene trinitramine
TETRYL 2, 4, 6, Trinitrophenylmethyinitramine (Explosive)
TNB Trinitrobenzene
U Analyte not detected above the reporting limit
UJ Analyte was not detected above the reporting limit; however, the reporting limit is considered an estimated value.
ND Analyte not detected above the method detection limit or laboratory reporting limit.

4.4.4 Conceptual Site Model

Based on information obtained from the Range Control Range Officer, the Hand Grenade Course is located within the footprint of an operational small arms range impact area and as such this MRS is not eligible under the MMRP, a CSM was therefore not completed.

4.4.5 Site Summary and Conclusions

4.4.5.1 MEC

A limited magnetometer assisted visual survey of a five-foot wide lane was conducted along the short path to the sampling location. No MEC or munitions debris was observed along the path to the sample location; however, based on the multiple overlapping range fans, there is a possibility that MEC may remain at the Hand Grenade Course.

4.4.5.2 MC

One composite surface soil sample was collected from the Hand Grenade Course and analyzed for aluminum, copper, zinc, lead, antimony, and explosives in order to complete the MRSPP. Based on the results of the metals analysis, metals were detected in concentrations exceeding FTSW established background levels and Region 4 ecological screening values for lead and zinc. The sample also exceeded the Region 4 ecological screening value for copper. No explosive compounds were detected above laboratory detection or reporting limits.

4.4.6 Site Recommendations

Based on information obtained from the Range Control Range Officer, the Hand Grenade Course is located within the footprint of an operational small arms range impact area and as such this MRS is not eligible under the MMRP.

4.5 SMALL ARMS RANGE - 1

4.5.1 Site Description and Historical Overview

The MRS layout and location are presented on Map 4-5. This MRS is a 136-acre parcel located at Evans Heliport/Airfield, northeast of the cantonment area, and was overlapped by two historical small arms ranges. These ranges were operational in 1962 and 1964. According to documents reviewed for the HRR, munitions used on the small arms range were .50-cal or less; however, the exact caliber is unknown. No EOD responses have been reported for this MRS.

4.5.2 Fieldwork Activities

4.5.2.1 MEC Activities and Purpose

No MEC field activities were recommended for this MRS because historical evidence suggests that only small arms were used at the site.

4.5.2.2 MC Activities and Purpose

An all-metals detector assisted visual survey was conducted in order to locate remnants of small arms rounds in an attempt to located biased sample locations. The all-metals detector assisted visual survey was completed by traversing 5-foot-wide transects spaced 40 ft apart. A visual depiction of the visual survey transects can be found on Map 4-5. Four composite surface soil samples were collected at biased locations when possible (near remnants of small arms, if identified) or at random locations on undeveloped portions of the MRS. Based on the historical layout and use of this MRS, berms or burial areas were not anticipated; therefore, only surface soil samples (at a depth of zero to 6 inches) were collected. Soil samples were analyzed for antimony and lead using USEPA Method 6020 and copper using USEPA Method 6010B. Analytical data were compared to the FTSW background values, then the USEPA Region 9 residential PRGs for copper, antimony, and lead and the Region 4 ecological screening values for copper, antimony, and lead in surface soil.

4.5.3 Fieldwork Results

4.5.3.1 MEC Results

No MEC field activities were recommended for this MRS because historical evidence suggests that only small arms were used at the site. During the all-metals detector assisted visual survey, evidence of recent training activities was observed, including an area that was marked with a sign that said "mines." Several landmines were observed hanging from trees and lying on the ground. The mines were had the word "Inert" written on them in black permanent marker. The items were assumed to be practice mines and, therefore, are characterized as munitions debris. Based on the physical condition of the munitions debris observed, the items are estimated to be less than five years old and, therefore, the debris items are not eligible under the MMRP. Figure 4-9 and Figure 4-10 contains photos of the types of munitions debris found at the MRS. Map4-5 shows the locations of the discoveries at Small Arms Range - 1. Table 4-7 presents the discoveries, the associated Map 4-5 item identification names, and item descriptions.

Figure 4-9: Sign indicating a mine field area

Figure 4-10: Inert landmine hanging from a tree

Table 4-7: Site Discoveries at Small Arms Range - 1

Map 4-5 Item ID	Description
MEC Item	
None	None
Munitions Debris	
Blank ammunition	Blank ammunition
Expended M143 pop flare	Expended M143 pop flare
Landmines	Inert landmines lying on the ground and hanging from trees
Structures/Debris	
Barbed wire fence	Two areas (separate of the mine field area) are surrounded by barbed wire fence appeared to be used for recent training activities.
Surface Features	
None	None

4.5.3.2 MC Results

Two biased (FTSW-SA1-08, FTSW-SA1-09) and two random (FTSW-SA1-07, FTSW-SA1-10) composite surface soil samples were collected from Small Arms Range - 1 and analyzed for antimony and lead using USEPA Method 6020 and copper using USEPA Method 6010B. The analytical data are summarized in Table 4-12, and sample locations are shown on Map 4-5.

The following are the results of the soil sampling analysis at Small Arms Range - 1:

- **Lead:** No samples exceeded the residential PRG or the FTSW established background level for lead.
- **Other metals:** No samples exceeded the residential PRGs, the FTSW established background values, or the Region 4 ecological screening values for antimony or copper.

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Map 4-5
Small Arms Range - 1

Legend

- Installation Boundary
- Munitions Response Site
- Lake or Pond
- Site Reconniassance
- Surface Soil Sample Location
- Munitions Debris

Military Range Area

- Operational Range Area
- Non Range, Non UXO-DMM-MC Area

0 150 300 450 600 Meters

Data Source: CTT Inventory Data
Microsoft TerraServer
USGS Digital Raster Graphics

Coordinate System: UTM Zone 17N
Datum: WGS 84
Units: Meters

Contract: DACA31-00-D-0043
Edition: Final Confimatory Sampling Report
Date: November 2007

Table 4-8: Small Arms Range 1 Analytical Data

Analyte	MDLs mg/kg	Laboratory RLs mg/kg	FTSW[1] Inorganic Metal Background Concentrations mg/kg	EPA Region 9 PRGs mg/kg	Region 4 Ecological Surface Soil Screening mg/kg	FTSW-SA1-07	FTSW-SA1-08	FTSW-SA1-09	FTSW-SA1-10
METALS (mg/kg)									
Antimony	0.6	3	-	31	-	0.056 (J)	0.010 (J)	0.019 (J)	0.017 (J)
Copper	0.3	1.5	-	31,000	9	2 (J)	6	0.8 (J)	1 (J)
Lead	0.3	1.5	11.1	400	2.5	6.8	6.1	5.2	7.9

Notes:

(1) Information provided by Phase II RCRA Facility Investigation Report for 16 Solid Wate Management Units At Fort Stewart, GA

Bold	exceeded FTSW background
(yellow)	exceeded Region 4 Water Screening Values
(blue)	exceeded Region 4 Ecological Soil Screening Values
(pink)	exceeded EPA Region 9 PRGs for Residential Soil

Definitions:

AM Amino
C Carcinogen
DNB Dinitrobenzene
HMX High Melting Point Explosive
J Analyte was positively identified; however, the result should be considered an estimated value
mg/kg milligram/kilogram
µg/kg microgram/kilogram
N Non-carcinogen
NB Nitrobenzene
NT Nitrotoluene
RDX Ciclotrimethylene trinitramine
TETRYL 2, 4, 6, Trinitrophenylmethyinitramine (Explosive)
TNB Trinitrobenzene
U Analyte not detected above the reporting limit
UJ Analyte was not detected above the reporting limit; however, the reporting limit is considered an estimated value.

4.5.4 Conceptual Site Model

Based on the evidence of recent munitions related training observed during the field activities this MRS is not eligible for the MMRP, a CSM was therefore not completed.

4.5.5 Site Summary and Conclusions

4.5.5.1 MEC

MEC activities were not performed at the Small Arms Range – 1, as historical evidence indicates only small arms use at this MRS.

4.5.5.2 MC

Two biased and two random composite surface soil samples were collected and analyzed for antimony and lead using USEPA Method 6020 and copper using USEPA Method 6010B. The lead PRG and background level were not exceeded, indicating that lead levels are likely not evidence of an impact of the former land use. Analytical results do not indicate a presence of MC at the Small Arms Range - 1. Additionally, based on evidence of recent munitions related training activities, it appears that this area is not eligible for the MMRP, as munitions related training appears to be ongoing on this site.

4.5.6 Site Recommendations

The observations and analytical results obtained from the CS field activities indicate that an impact from the former land use is unlikely. Based on the evidence of recent munitions related training observed during the field activities Small Arms Range - 1 is not eligible for the MMRP.

4.6 SMALL ARMS RANGE - 2

4.6.1 Site Description and Historical Overview

This MRS was identified during the Phase 3 Range Inventory. As part of the HRR a thorough review of the documents used to generate the Phase 3 Range Inventory was conducted. As a result of this review it was determined that the historical small arms range fans that made up this MRS did overlap the cantonment area (non operational area) and as such this MRS is not eligible for the MMRP. It was therefore agreed upon during the TPP meeting that no further action is required for this MRS under the active installation MMRP, and no CSM was developed for this site.

4.6.2 Fieldwork Activities

As mentioned above no further action is required at this MRS, therefore no MEC/MC activities will be performed.

4.6.3 Fieldwork Results

No fieldwork was conducted at this site.

4.6.4 Conceptual Site Model

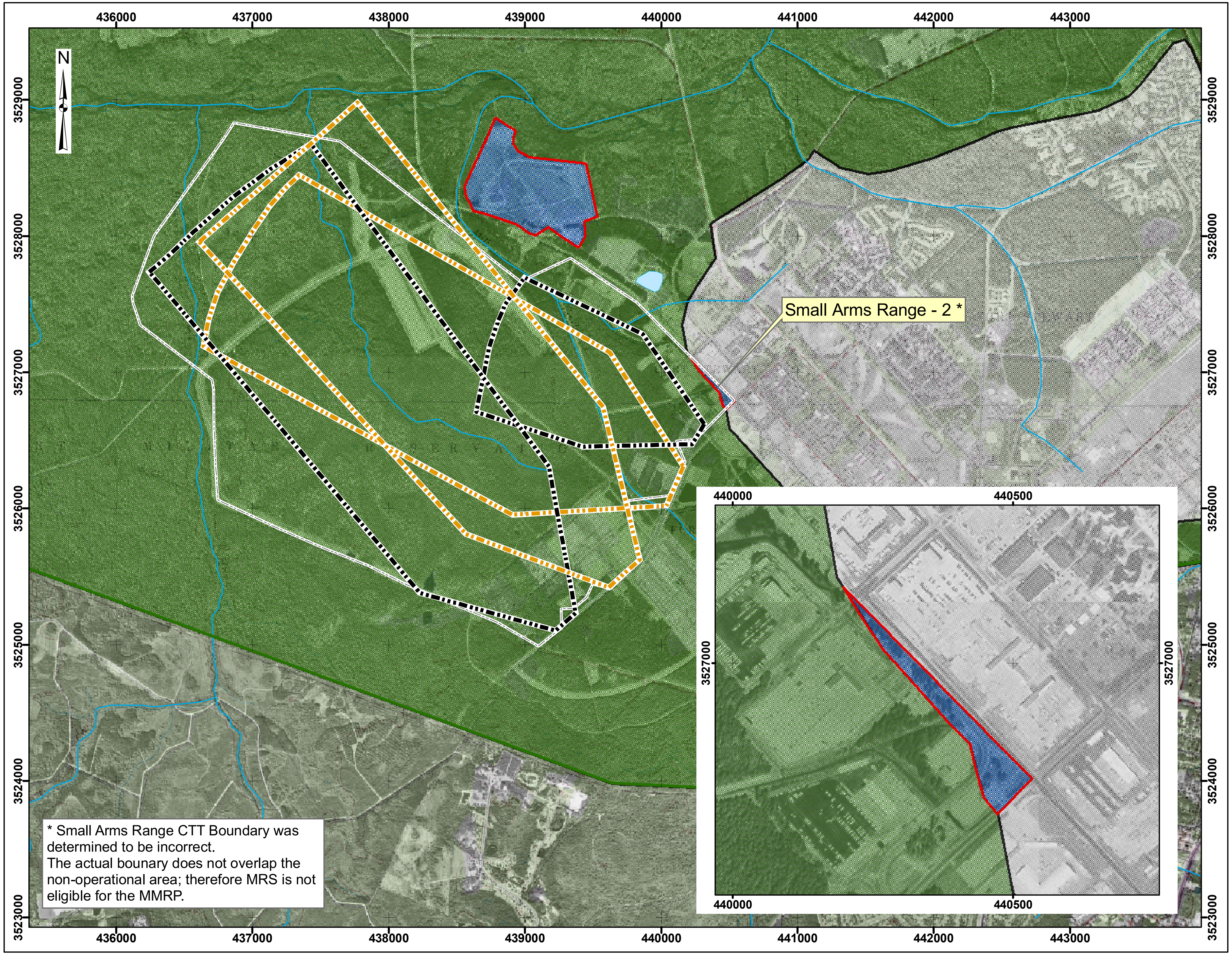
Based on the evidence from the HRR, this site is not eligible for the MMRP. Therefore a CSM was not completed.

4.6.5 Site Summary and Conclusions

As mentioned above no further action is required at this MRS.

4.6.6 Site Recommendations

No further action is required at this MRS.



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Map 4-6
Small Arms Range - 2

Legend

- Installation Boundary
- Munitions Response Site
- Streams/Rivers
- Lake or Pond

Military Range Area

- Operational Range Area
- Non Range, Non UXO-DMM-MC Area

Small Arms Range - 2 Historical Range Fans

- Small Arms 1941
- Small Arms 1943
- Small Arms, CTT

0 400 800 1,200 1,600 Meters

Data Source: CTT Inventory Data
Microsoft TerraServer
USGS Digital Raster Graphics

Coordinate System: UTM Zone 17N
Datum: WGS 84
Units: Meters

Contract: DACA31-00-D-0043
Edition: Final Confirmatory Sampling Report
Date: November 2007

4.7 SMALL ARMS RANGE - 3

4.7.1 Site Description and Historical Overview

The MRS layout and location are presented on Map 4-7. This MRS is a 32-acre parcel in the area northeast of the cantonment area, within 1 mile of the Holbrook Pond Recreational Area. The overlapping historical munitions use is a small arms range used in 1964. According to documents reviewed for the HRR, munitions used on the small arms range are believed to have been .50-cal or less; however, the exact caliber is unknown. No EOD responses have been reported for this MRS. Table 4-11 provides a summary of the specific munitions that potentially were used at Small Arms Range - 3 based on the HRR findings.

4.7.2 Fieldwork Activities

4.7.2.1 MEC Activities and Purpose

No MEC field activities were recommended for this MRS because historical evidence suggests that only small arms were used at the site.

4.7.2.2 MC Activities and Purpose

An all-metals detector assisted visual survey was conducted in order to locate remnants of small arms rounds in an attempt to locate biased sample locations. The all-metals detector assisted visual survey was completed by traversing transects spaced 40 ft apart. A visual depiction of the transects can be found on Map 4-7. Three composite surface soil samples were collected at biased locations when possible (near remnants of small arms, if identified) or at random locations throughout the site. Two sediment and two surface water samples were also collected at this MRS. Based on the historical layout and use of this MRS, berms or burial areas are not anticipated; therefore, only surface soil samples (at a depth of zero to 6 inches) were collected. One soil sample was collected in the northern portion and two samples were collected in the southern portion of this MRS. A sediment sample was collected from each of the man-made dams of the pond. The surface water samples were collected near the sediment sample locations. All samples were analyzed for copper using USEPA Method 6010B and for antimony and lead using USEPA Method 6020. Data were compared to the FTSW background values and then the

USEPA Region 9 residential PRGs, Region 4 ecological screening values for surface soil, USEPA water quality standards for freshwater CCC chronic, and Region 4 ecological screening values for surface water for copper, antimony, and lead, as appropriate.

4.7.3 Fieldwork Results

4.7.3.1 MEC Results

No MEC field activities were recommended for this MRS because historical evidence suggests that only small arms were used at the site.

4.7.3.2 MC Results

Three composite surface soil samples were collected from random locations, as no evidence of small arms rounds was observed. Two sediment and two surface water samples were also collected at this MRS. None of the samples exceeded the PRGs or background limits for antimony, copper, or lead. The analytical data are summarized in Tables 4-9 and 4-10, and sample locations are shown on Map 4-7.

The following are the results of the sampling analysis at Small Arms Range - 3:

- **Lead:** No samples exceeded the residential PRG or the FTSW established background level for lead.
- **Other metals:** No samples exceeded the residential PRGs, the FTSW established background values, or the Region 4 ecological screening values for antimony or copper.

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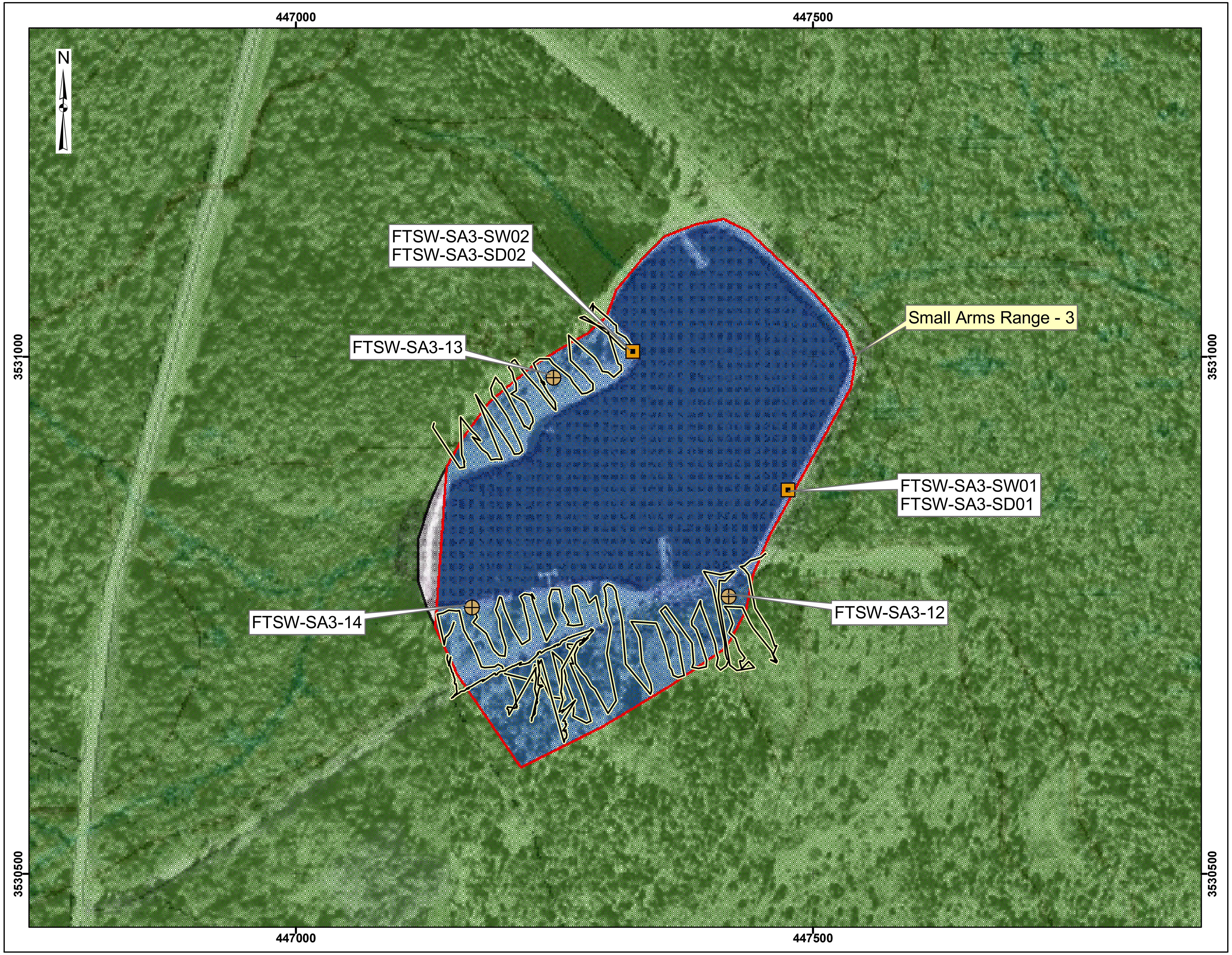
Map 4-7
Small Arms Range - 3



Legend

- Installation Boundary
- Munitions Response Site
- Streams/Rivers
- Lake or Pond
- Site Reconnaissance
- Surface Soil Sample Location
- Surface Water and Sediment Sample Location

Military Range Area

- Closed
- Operational Range Area
- Non Range, UXO-DMM-MC Area

0 50 100 150 200 Meters

Data Source: CTT Inventory Data
Microsoft TerraServer
USGS Digital Raster Graphics

Coordinate System: UTM Zone 17N
Datum: WGS 84
Units: Meters

Contract: DACA31-00-D-0043
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Table 4-9: Small Arms Range 3 Analytical Data

Analyte	MDLs mg/kg	Laboratory RLs mg/kg	FTSW[1] Inorganic Metal Background Concentrations mg/kg	EPA Region 9 PRGs mg/kg	Region 4 Ecological Surface Soil Screening mg/kg	FTSW-SA3-12	FTSW-SA3-12D	FTSW-SA3-13	FTSW-SA3-14	FTSW-SA3-SD01	FTSW-SA3-SD01D	FTSW-SA3-SD02
						Soil				Sediment		
METALS (mg/kg)												
Antimony	0.6	3	-	31	-	0.072 (J)	0.039 (J)	0.026 (J)	0.017 (J)	0.084 (J)	0.032 (J)	0.017 (J)
Copper	0.3	1.5	-	31,000	9	1 (J)	1 (J)	1 (J)	0.8 (J)	0.4 (J)	0.4 (J)	2 (J)
Lead	0.3	1.5	11.1	400	2.5	6.7	6.6	8.6	4.6	1.4	1.1	5.4

Notes:

(1) Information provided by Phase II RCRA Facility Investigation Report for 16 Solid Wate Management Units At Fort Stewart, GA

Bold	exceeded FTSW background
(yellow)	exceeded Region 4 Water Screening Values
(cyan)	exceeded Region 4 Ecological Soil Screening Values
(pink)	exceeded EPA Region 9 PRGs for Residential Soil

Definitions:

AM Amino
C Carcinogen
DNB Dinitrobenzene
HMX High Melting Point Explosive
J Analyte was positively identified; however, the result should be considered an estimated value
mg/kg milligram/kilogram
µg/kg microgram/kilogram
N Non-carcinogen
NB Nitrobenzene
NT Nitrotoluene
RDX Ciclotrimethylene trinitramine
TETRYL 2, 4, 6, Trinitrophenylmethyinitramine (Explosive)
TNB Trinitrobenzene
U Analyte not detected above the reporting limit
UJ Analyte was not detected above the reporting limit; however, the reporting limit is considered an estimated value.
ND Analyte not detected above the method detection limit or laboratory reporting limit.

Table 4-10: Small Arms Range 3 Analytical Data

Analyte	MDLs µg/l	Laboratory RLs µg/l	Human Health Consumption of Water Consumption µg/l	Region 9 PRGs Tap Water µg/l	Region 4 Ecological Screening Values Surface Water µg/l	FTSW-SA3-SW01	FTSW-SA3-SW02
METALS (mg/l)							
Antimony	0.3	2	6	15	160.0	ND	ND
Copper	0.3	2	1,300	15	6.54	0.005 (J)	0.005 (J)
Lead	0.3	2	-	-	1.32	0.0003 (J)	0.0008 (J)

Notes:

(1) Information provided by Phase II RCRA Facility Investigation Report for 16 Solid Wate Management Units At Fort Stewart, GA

Bold	exceeded FTSW background
(yellow)	exceeded Region 4 Water Screening Values
(light blue)	exceeded Region 4 Ecological Soil Screening Values
(pink)	exceeded EPA Region 9 PRGs for Residential Soil

Definitions:

AM Amino
C Carcinogen
DNB Dinitrobenzene
HMX High Melting Point Explosive
J Analyte was positively identified; however, the result should be considered an estimated value
mg/kg milligram/kilogram
µg/kg microgram/kilogram
N Non-carcinogen
NB Nitrobenzene
NT Nirotoluene
RDX Ciclotrimethylene trinitramine
TETRYL 2, 4, 6, Trinitrophenylmethyinitramine (Explosive)
TNB Trinitrobenzene
U Analyte not detected above the reporting limit
UJ Analyte was not detected above the reporting limit; however, the reporting limit is considered an estimated value.
ND Analyte not detected above the method detection limit or laboratory reporting limit.

4.7.4 Conceptual Site Model

4.7.4.1 MMRP Site Profile

4.7.4.1.1 Area and Layout

The Small Arms Range – 3 MRS is approximately 32 acres located along the southern portion of the installation. The area is located approximately 2.5 miles northeast of the cantonment area.

4.7.4.1.2 Structures

There are five buildings on site. Additional structures on site include a pier and a playground area.

4.7.4.1.3 Utilities

Specific information on any utilities located at the site is unknown.

4.7.4.1.4 Boundaries

The eastern boundary of –the MRS is an unidentified road. Undeveloped property surrounds the site to the north, south, and west. A camping area is located just outside of the southern boundary.

4.7.4.1.5 Security

There is no security on this site.

4.7.4.2 Physical Profile

4.7.4.2.1 Climate

General installation climate information is presented in Section 4.2.4.2.1.

4.7.4.2.2 Geology

General information about the geology at FTSW is presented in Section 4.2.4.2.2. No specific geologic information pertaining to the site was available.

4.7.4.2.3 Topography

General information about installation topography is presented in Section 4.2.4.2.3. The site is approximately 33 ft amsl and is flat and level.

4.7.4.2.4 Soil

General information about the soil types present on FTSW is presented in Section 4.2.4.2.4. The soil at the site is classified as sand-silt/sand-clay.

4.7.4.2.5 Hydrogeology

General information about the hydrogeologic conditions at FTSW is presented in Section 4.2.4.2.5. No specific hydrogeologic information pertaining to the site was available.

4.7.4.2.6 Hydrology

General information about hydrologic conditions at FTSW is presented in Section 4.2.4.2.6. Specific site hydrology includes a stream located northeast of site and a pond on the site. Holbrook Pond covers approximately 75% of the site.

4.7.4.2.7 Vegetation

General information about vegetation at the installation is presented in Section 4.2.4.2.7. The site is a combination of forested area and grasslands as well as some wetland vegetation.

4.7.4.3 Land Use and Exposure Profile

4.7.4.3.1 Current Land Use / Activities

The current land use includes a recreational area, a pond, little undeveloped property, and five buildings.

4.7.4.3.2 Current Human Receptors

Current human receptors include installation personnel, contractors, recreational users, visitors, and trespassers.

4.7.4.3.3 Potential Future Land Use

There is no known change in land use at this time; the potential future land use is assumed to be the same as the current land use.

4.7.4.3.4 Potential Future Human Receptors

As there is no known change in land use at this time, the future human receptors of potential MEC or MC remain the same as the current human receptors.

4.7.4.3.5 Zoning / Land Use Restrictions

General information about zoning and land use restrictions at FTSW is presented in Section 4.2.4.3.5. Site-specific information about zoning and land use is unknown.

4.7.4.3.6 Beneficial Resources

General information about the beneficial resources at FTSW is found within Section 4.2.4.3.6. Site-specific resources include the pond and the forested areas, which act as habitat. During the field effort, wetlands were observed adjacent to Small Arms Range - 3 to the north and to the west.

4.7.4.3.7 Demographics/Zoning

General information about the demographics/zoning at FTSW is presented in Section 4.2.4.3.7.

4.7.4.4 Ecological Profile

4.7.4.4.1 Habitat Type

General information on habitat types at FTSW is provided in Section 4.2.4.4.1. Site-specific habitat types include the pond and the forested and grassy areas.

4.7.4.4.2 Degree of Disturbance

Currently, there is a low degree of disturbance. The site includes Holbrook Pond and a forested area with little development.

4.7.4.4.3 Ecological Receptors

General information about the ecological receptors on FTSW is presented in Section 4.2.4.4.3. Site-specific ecological receptors include alligators and all other species that may be found at FTSW.

4.7.4.5 Munitions/Release Profile

4.7.4.5.1 Munitions Types and Release Mechanisms

Table 4-11 presents a summary of the types of munitions debris and MEC that were identified either during CS field activities or during research conducted for the HRR. The mechanisms by which the munitions, if present, could have been released into the environment are also presented in the table. It is important to note that because this area is suspected of being a small arms range, MEC are not expected and the primary concern would be associated with MC.

Table 4-11: Summary of Potential and Actual Munitions Debris and MEC - Small Arms Range - 3

MRS	Munitions Debris / MEC Observed During CS Field Activities	Munitions Debris / MEC Identified During HRR	Primary Release Mechanism
Small Arms Range - 3	None	0.22-cal, 0.30-cal, 0.30-cal (with tracer), 0.45-cal, 0.50-cal, 0.50-cal (with tracer), and 0.50-cal (armor piercing)	Munitions firing Malfunctioned munitions Discarded munitions

4.7.4.5.2 MEC Density

Due to the nature of small arms ammunition, MEC are not expected.

4.7.4.5.3 Munitions Debris

Based on the activities that occurred at the former range, MEC is not expected. Potential munitions debris associated with small arms ammunition include spent projectiles, fragments, and shell casings. No EOD calls have been reported at this site.

4.7.4.5.4 Associated MC

Potential MC associated with small arms used on Small Arms Range - 3 include lead, antimony, tin, arsenic, copper, zinc, iron, strontium, magnesium, and lead styphante/lead azide. Ordnance Technical Data Sheets are in Appendix H.

Surface soil, sediment, and surface water samples collected within the boundary of Small Arms Range - 3 have been analyzed for antimony and lead using USEPA Method 6020 and copper using USEPA Method 6010B. None of the samples exceeded the residential PRGs for antimony, copper, and lead. Analytical results indicate that lead concentrations are within FTSW established background level and, therefore, are likely naturally occurring and are likely not evidence of an impact of the former land use. It is unknown if this is used for drinking water.

4.7.4.5.5 Transport Mechanisms / Migration Routes

The primary transport mechanisms identified for Small Arms Range - 3 include the following:

- **Erosion:** Small Arms Range - 3 is mostly a pond; therefore, erosion is possible in this area and is a factor in transporting and migrating possible MC contaminated soil.
- **Soil disturbance:** The current degree of disturbance is relatively low, as most of the area has not been developed since the range was used. More development, especially in the forested area, could unveil potential MC that are in the surface or subsurface.
- **Infiltration:** Based on the soil types associated with Small Arms Range - 3, the potential exists for MC to migrate from one environmental medium to another (surface to subsurface soil to groundwater) through filtration.

4.7.4.6 Pathway Analysis

4.7.4.6.1 MEC

Based on historical documents and information obtained during the data collection process, there is no evidence of MEC at Small Arms Range – 3, as only small arms ammunition is assumed to have been used. MEC are not associated with small arms ranges; therefore, an MEC Exposure Pathway Analysis was not created.

4.7.4.6.2 MC

Analytical results indicate that lead concentrations are within the FTSW established background level and, therefore, likely naturally occurring and are likely not evidence of an impact of the former land use. Analytical results do not indicate a presence of MC. Therefore, no complete or potentially complete pathways exist at the Small Arms Range - 3. Based on this, an MC Exposure Pathway Analysis was not created.

4.7.5 Site Summary and Conclusions

4.7.5.1 MEC

MEC activities were not performed at the Small Arms Range – 3, as historical evidence indicates that only small arms were used at this MRS.

4.7.5.2 MC

Three composite surface soil, two sediment, and two surface water samples were collected and analyzed for antimony and lead using USEPA Method 6020 and copper using Method 6010B. The residential PRG and background level were not exceeded, indicating that lead is likely naturally occurring at the levels found at this MRS and is likely not evidence of an impact of the former land use. Analytical results do not indicate a presence of MC at Small Arms Range - 3.

4.7.6 Site Recommendations

The analytical results obtained from the CS field activities indicate an impact from the former land use is unlikely. No evidence of small arms munitions was observed during the field activities. Based on this information, the Small Arms Range - 3 is recommended for NFA.

4.8 HERO ROAD TRENCH AREA

4.8.1 Site Description and Historical Overview

The MRS layout, location, and approximate sample point are presented on Map 4-8. The Hero Road Trench Area is a 10-acre parcel located within the cantonment area; it was identified in January 2003, when a former FTSW Directorate of Public Works (DPW) staff member reported to the DPW Environmental Office that materials (i.e., mustard gas) had been buried in the DPW Family Housing Maintenance parking lot located on Hero Road. Aerial photographs indicate disturbances from January 1941 to January 1957 that are indicative of possible burial activities. Items were allegedly buried at the MRS, but not used on this MRS. Chemical Agent Identification Set, Detonation, M1, containing 5% solution of mustard, 5% solution of lewisite, 50% solution of chloropicrin, and pure agent phosgene. No EOD responses have been reported for this MRS. This MRS is partially fenced.

4.8.2 Fieldwork Activities

4.8.2.1 MEC Activities and Purpose

MEC field activities planned for this MRS included conducting a limited magnetometer-assisted visual survey in the unfenced portions of the MRS. The primary purpose of the visual survey was to ensure that no MEC or munitions debris remains on the surface during sampling activities. The secondary purpose of the visual survey was to confirm the MRS acreage and boundaries.

4.8.2.2 MC Activities and Purpose

One random composite surface soil sample was collected from the Hero Road Trench Area in order to complete the MRSPP. The soil sample was analyzed for aluminum, copper, and zinc (USEPA Method 6010B); lead and antimony (USEPA Method 6020); and explosives (USEPA Method 8330). Data were compared to FTSW inorganic/metal background values, USEPA Region 9 residential PRGs, and Region 4 ecological screening values for surface soil. This site is recommended for RFI/CMS based on historical evidence that MEC was used at the site.

4.8.3 Fieldwork Results

4.8.3.1 MEC Results

A limited magnetometer-assisted visual survey was conducted along the perimeter of the fence line and in the non-fenced portions located in the southern most point of the MRS. No MEC or munitions debris was observed at the Hero Road Trench Area. The path walked during the limited magnetometer-assisted visual survey is presented on Map 4-8. As a result of the limited magnetometer-assisted visual survey the MRS acreage was found to be 34.5-acres. The MRS contained both a northern fenced portion and a southern unfenced portion with areas of approximately 31 and 3.5 acres respectively.

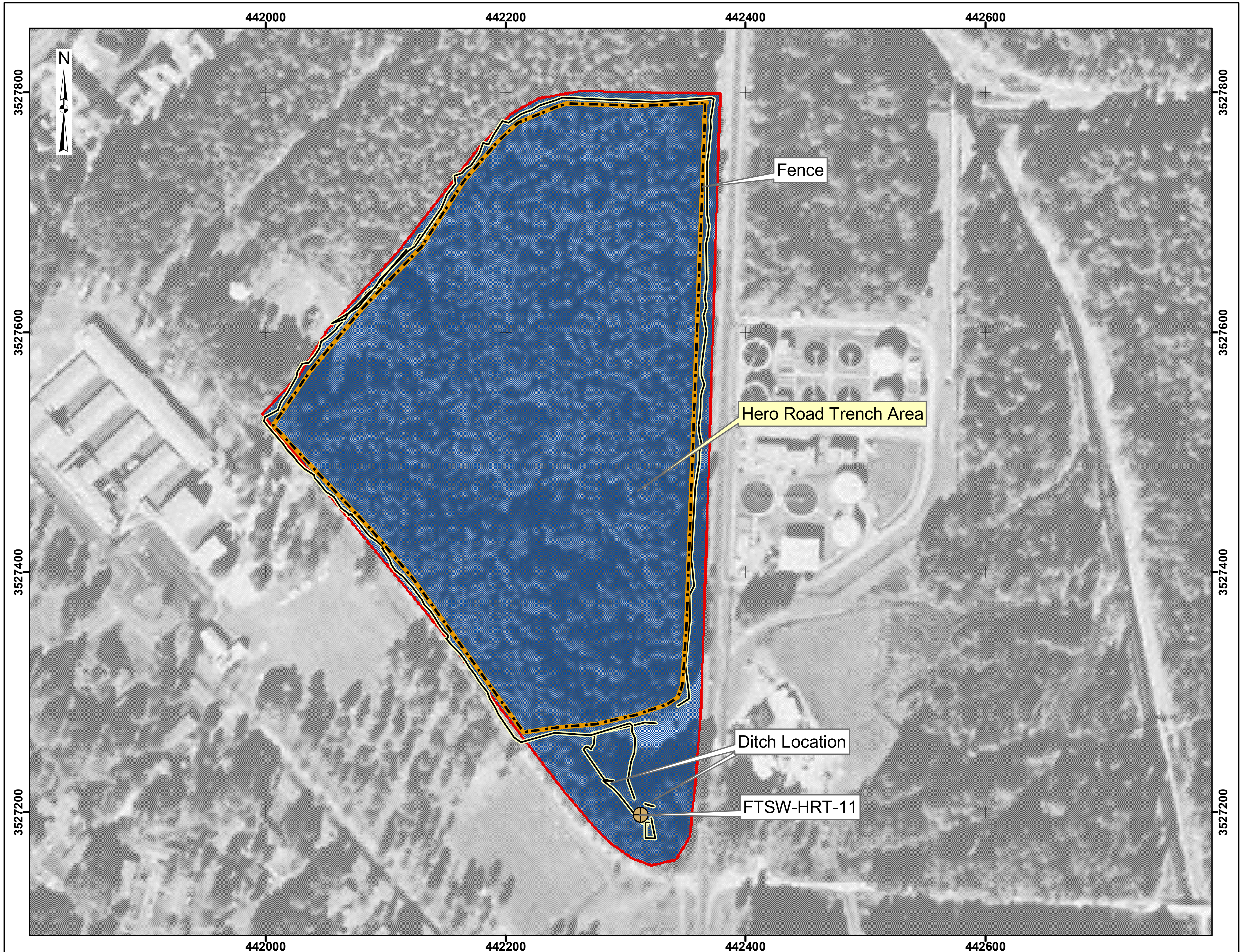
Observations made during the visual survey indicate that the ground surface is very uneven and inconsistent in the southern most portion of the area. According to storm water management division staff at FTSW, this area is not a storm water run off area. The uneven and inconsistent ground surface is believed to be associated with the historical land fill indicating that some of the landfill remains unfenced. Map 4-8 shows the limited magnetometer-assisted visual survey area and locations of the ditch surface features observed at the Hero Road Trench Area.

4.8.3.2 MC Results

One composite surface soil sample was collected from the Hero Road Trench Area and analyzed for aluminum, copper, and zinc (USEPA Method 6010B); lead and antimony (USEPA Method 6020); and explosives (USEPA Method 8330). The analytical data are summarized in Table 4-17, and sample locations are shown on Map 4-8.

The following are the results of the soil sampling analysis at the Hero Road Trench Area:

- **Lead:** The sample did not exceed the residential PRG for lead. The sample exceeded the FTSW established background level for lead and the Region 4 ecological screening value for lead in surface soil.
- **Other metals:** The sample did not exceed the residential PRGs, the FTSW established background levels, or the Region 4 ecological screening values for aluminum, antimony, copper, or zinc.
- **Explosives:** No explosives were detected above laboratory reporting or method detection limits.



Confimatory Sampling Report
Fort Stewart, GA

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Map 4-8
Hero Road Trench Area

Legend

- Installation Boundary
- Munitions Response Site
- Fence
- Site Reconnaissance
- Surface Soil Sample Location

Military Range Area

- Operational Range Area
- Non Range, Non UXO-DMM-MC Area

*Note: All sample locations shown are approximate

0 50 100 150 200 Meters

Data Source: CTT Inventory Data
Microsoft TerraServer

Coordinate System: UTM Zone 17N
Datum: WGS 84
Units: Meters

Contract: DACA31-00-D-0043
Edition: Final Confimatory Sampling Report
Date: November 2007

Table 4-12: Hero Road Trench Analytical Tables

Analyte	MDLs mg/kg	Laboratory RLs mg/kg	FTSW[1] Inorganic Metal Concentrations mg/kg	EPA Region 9PRGs mg/kg	Region 4 Ecological Surface Soil mg/kg	FTSW-HRT-11
METALS (mg/kg)						
Aluminum	2	10	-	76,000	-	1,390
Antimony	0.6	3	-	31	-	0.83
Copper	0.3	1.5	-	31,000	9	1 (J)
Lead	0.3	1.5	11.1	400	2.5	**25.8**
Zinc	0.7	3.5	15.5	23,000	120	2 (J)
EXPLOSIVES (ug/kg)						
1,3,5-TNB	0.05	0.25	N/A[2]	1,800	-	ND
1,3-DNB	0.05	0.25	N/A	6.1	-	ND
2,4,6-TNT	0.03	0.25	N/A	16	-	ND
2,4-DNT	0.04	0.25	N/A	120	20	ND
2,6-DNT	0.05	0.25	N/A	61	-	ND
2-AM-4,6-DNT	0.1	0.5	N/A	-	-	ND
2-NT	0.03	0.25	N/A	180	-	ND
3-NT	0.02	0.25	N/A	180	-	ND
4-AM-2,6-DNT	0.1	0.5	N/A	-	-	ND
4-NT	0.03	0.25	N/A	12	-	ND
HMX	0.04	0.25	N/A	3,100	-	ND
NB	0	1	N/A	20	40	ND
RDX	0.1	0.5	N/A	4.4	-	ND
TETRYL	0.2	1	N/A	16	-	ND

Notes:

(1) Information provided by Phase II RCRA Facility Investigation Report for 16 Solid Wate Management Units At Fort Stewart, GA

Bold	exceeded FTSW background
(yellow)	exceeded Region 4 Water Screening Values
(light blue)	exceeded Region 4 Ecological Soil Screening Values
(pink)	exceeded EPA Region 9 PRGs for Residential Soil

Definitions:

AM Amino
C Carcinogen
DNB Dinitrobenzene
HMX High Melting Point Explosive
J Analyte was positively identified; however, the result should be considered an estimated value
mg/kg milligram/kilogram
µg/kg microgram/kilogram
N Non-carcinogen
NB Nitrobenzene
NT Nitrotoluene
RDX Ciclotrimethylene trinitramine
TETRYL 2, 4, 6, Trinitrophenylmethyinitramine (Explosive)
TNB Trinitrobenzene
U Analyte not detected above the reporting limit
UJ Analyte was not detected above the reporting limit; however, the reporting limit is considered an estimated value.
ND Analyte not detected above the method detection limit or laboratory reporting limit.

4.8.4 Conceptual Site Model

4.8.4.1 MMRP Profile

4.8.4.1.1 Area and Layout

The Hero Road Trench Area is approximately 34.5 acres located in the southern portion of the installation. The area is located in the center of the cantonment area.

4.8.4.1.2 Structures

The only structure on the site is a chain link fence that secures the majority of the Hero Road Trench Area.

4.8.4.1.3 Utilities

During the CS field effort, overhead power lines were observed running along the roads to the east and west of the MRS.

4.8.4.1.4 Boundaries

The area to the north of the site is undeveloped. The east, south, and west boundaries of the site are bordered by roads.

4.8.4.1.5 Security

A fence surrounds the north portion of the Hero Road Trench Area. There is no security on the southern portion of the site.

4.8.4.2 Physical Profile

4.8.4.2.1 Climate

General installation climate information is presented in Section 4.2.4.2.1.

4.8.4.2.2 Geology

General geologic information for FTSW is presented in Section 4.2.4.2.2. No specific geologic information pertaining to the site was available.

4.8.4.2.3 Topography

General information about the topography of FTSW is presented in Section 4.2.4.2.3. The Hero Road Trench Area is approximately 66 ft amsl; the site is generally flat and has level terrain. However in the southern most portion of this MRS the ground surface was observed to be very uneven and inconsistent in areas, indicating that some of the landfill remains unfenced..

4.8.4.2.4 Soil

General information about the soil types present on FTSW is presented in Section 4.2.4.2.4. The soil at the Hero Road Trench Area is classified as clay-sand/clay-silt.

4.8.4.2.5 Hydrogeology

General information about the hydrogeologic conditions at FTSW is presented in Section 4.2.4.2.5. There is no site-specific information on hydrogeology.

4.8.4.2.6 Hydrology

General information about hydrologic conditions at FTSW is presented in Section 4.2.4.2.6. There are no hydrology features on the site; however, there is a wetland near the site.

4.8.4.2.7 Vegetation

General information about vegetation at the installation is presented in Section 4.2.4.2.7. Hero Road Trench Area is primarily forested vegetation

4.8.4.3 Land Use and Exposure Profile

4.8.4.3.1 Current Land Use / Activities

The southern portion of the Hero Road Trench Area is undeveloped property. A portion of the area is being used as a parking lot. The northern portion of the Hero Road Trench Area is currently fenced off, and no use has been identified.

4.8.4.3.2 Current Human Receptors

The current human receptors of the Hero Road Trench Area are authorized installation personnel, contractors, and trespassers.

4.8.4.3.3 Potential Future Land Use

There is no known change in land use at this time; the potential future land use is assumed to remain the same as the current land use.

4.8.4.3.4 Potential Future Human Receptors

There is no known change in land use at this time; therefore, the potential future human receptors of potential MEC or MC remain the same as the current human receptors (authorized installation personnel, contractors, and trespassers.).

4.8.4.3.5 Zoning / Land Use Restrictions

General information about zoning and land use restrictions at FTSW is presented in Section 4.2.4.3.5. Site-specific information about zoning and land use is unknown.

4.8.4.3.6 Beneficial Resources

General information about the beneficial resources on FTSW is presented in Section 4.2.4.3.6. Site-specific resources include the forested areas, which act as habitat.

4.8.4.3.7 Demographics/Zoning

General information about the demographics/zoning on FTSW is presented in Section 4.2.4.3.7.

4.8.4.4 Ecological Profile

4.8.4.4.1 Habitat Type

General information on habitat types at FTSW is provided in Section 4.2.4.4.1. Site-specific habitat types include the forested areas.

4.8.4.4.2 Degree of Disturbance

Currently, there is a low degree of disturbance because the forest remains.

4.8.4.4.3 Ecological Receptors

General information about the ecological receptors on FTSW is presented in Section 4.2.4.4.3.

4.8.4.5 Munitions/Release Profile

4.8.4.5.1 Munitions Types and Release Mechanisms

Table 4-13 presents a summary of the types of potential munitions that were identified during research conducted for the HRR. The mechanisms by which the munitions, if present, could have been released into the environment are also presented in the table.

Table 4-13: Summary of Potential and Actual Munitions Debris and MEC – Hero Road Trench Area

MMRP Site	Munitions Debris / MEC Observed During CS Field Activities	Munitions Debris / MEC Identified During HRR	Primary Release Mechanism
Hero Road Trench Area	None	Chemical Agent Identification Sets Kits (M1)	Intentionally or unintentionally disposed items

4.8.4.5.2 Maximum Probability Penetration Depth

There is no associated maximum probability penetration depth for the Hero Road Trench Area since this site is a former trench and landfill area. The depths at which MEC could be located depend on the amount of fill placed on top of the items and are not representative of the depths presented in Engineering Manual 1110-1-4009 *Ordnance and Explosives Response*. MEC could be encountered at any depth within the landfill.

4.8.4.5.3 MEC Density

The MEC density of the Hero Road Trench Area is considered to be low since the activities conducted at Hero Road Trench Area did not include the firing of explosives. However, M1 detonation kits may be buried at the Hero Road Trench Area, and a small explosive charge is associated with M1 detonation. There have been no reported finds of MEC; however, the majority of the area is undeveloped.

4.8.4.5.4 Munitions Debris

A visual survey was conducted as part of the CS, and no MEC or munitions debris was observed; however, based on the activities that occurred at the site, there is the potential for munitions debris items. A geophysical survey was conducted in September 2003 on 4 acres off of Hero Road around the Family Housing Maintenance parking lot. Anomalies were recorded, but it could not be determined if they were from burial items or interference. No MEC or munitions debris is known to have been reported; however, a significant portion of the area is undeveloped.

4.8.4.5.5 Associated MC

One composite surface soil sample was collected from the MRS. The sample was analyzed for metals including aluminum, copper, zinc (USEPA Method 6010B), lead, antimony (USEPA Method 6020), and explosives (USEPA Method 8330). Explosives were not detected at the site. Based on analytical results, lead was the only metal detected in concentrations exceeding FTSW established background levels and Region 4 ecological values but below PRGs. No explosive compounds were detected above laboratory detection or reporting limits.

4.8.4.5.6 Transport Mechanisms / Migration Routes

The primary transport mechanisms identified for the Hero Road Trench Area include the following:

- **Erosion:** The Hero Road Trench Area is near a wetland; therefore, erosion is possible in this area and is a factor in transporting and migrating possible MC contaminated soil.
- **Soil disturbance:** The current degree of disturbance is relatively low, as most of the area has not been developed since the range was used. More development, especially in the forested area, could unveil potential MC that are in the surface or subsurface.
- **Infiltration:** Based on the soil types associated with Hero Road Trench Area, the potential exists for MC to migrate from one environmental medium to another (surface to subsurface soil to groundwater) through filtration.

4.8.4.6 Pathway Analysis

4.8.4.6.1 MEC

Based on historical documents and information obtained during the data collection process, M1 detonation kits may be buried at the Hero Road Trench Area. A small explosive charge is associated with M1 detonation kits; therefore, the potential exists for MEC on the MRS. The northern portion of the MRS is currently fenced and the southern portion of the MRS is not fenced; therefore, access is partially controlled. Since the site is reportedly a burial site, no MEC are expected to be present on the surface. As illustrated in the MEC Exposure Pathway Analysis (Figure 4-11), no complete or potentially complete pathways for human or ecological receptors for MEC on the surface are expected to exist. Potentially complete pathways exist for authorized installation personnel, authorized contractors, and biota for MEC in the subsurface as these receptors have the potential to conduct intrusive activities. The pathway for MEC in the subsurface is incomplete for all other receptors.

4.8.4.6.2 MC

As illustrated in the MC Exposure Pathway Analysis (Figure 4-12), soil and groundwater represent the potential primary source media. One surface soil sample collected within the boundary of the Hero Road Trench Area was analyzed for aluminum, copper, and zinc by USEPA Method 6010B, lead and antimony by USEPA Method 6020, and explosives by USEPA

Method 8330. Analytical results indicate no explosives were detected and no metals exceeded regulatory PRGs. Lead and zinc were found at concentrations that exceed background and the lead copper and zinc exceeded the ecological value.

Food Chain

A potentially complete pathway to MC in the source media through uptake into vegetation exists for grazing/foraging biota. This exposure pathway is incomplete for all other receptors as there are no agricultural activities taking place on the MRS. As there are no domestic animals on FTSW and only ecological screening values were exceeded, the pathway to MC in the source media through this exposure route is incomplete for all human receptors. The pathway to MC in the source media through the game/fish/prey exposure route is potentially complete for biota. This exposure pathway is incomplete for all other receptors as hunting is not permitted in this area.

Groundwater

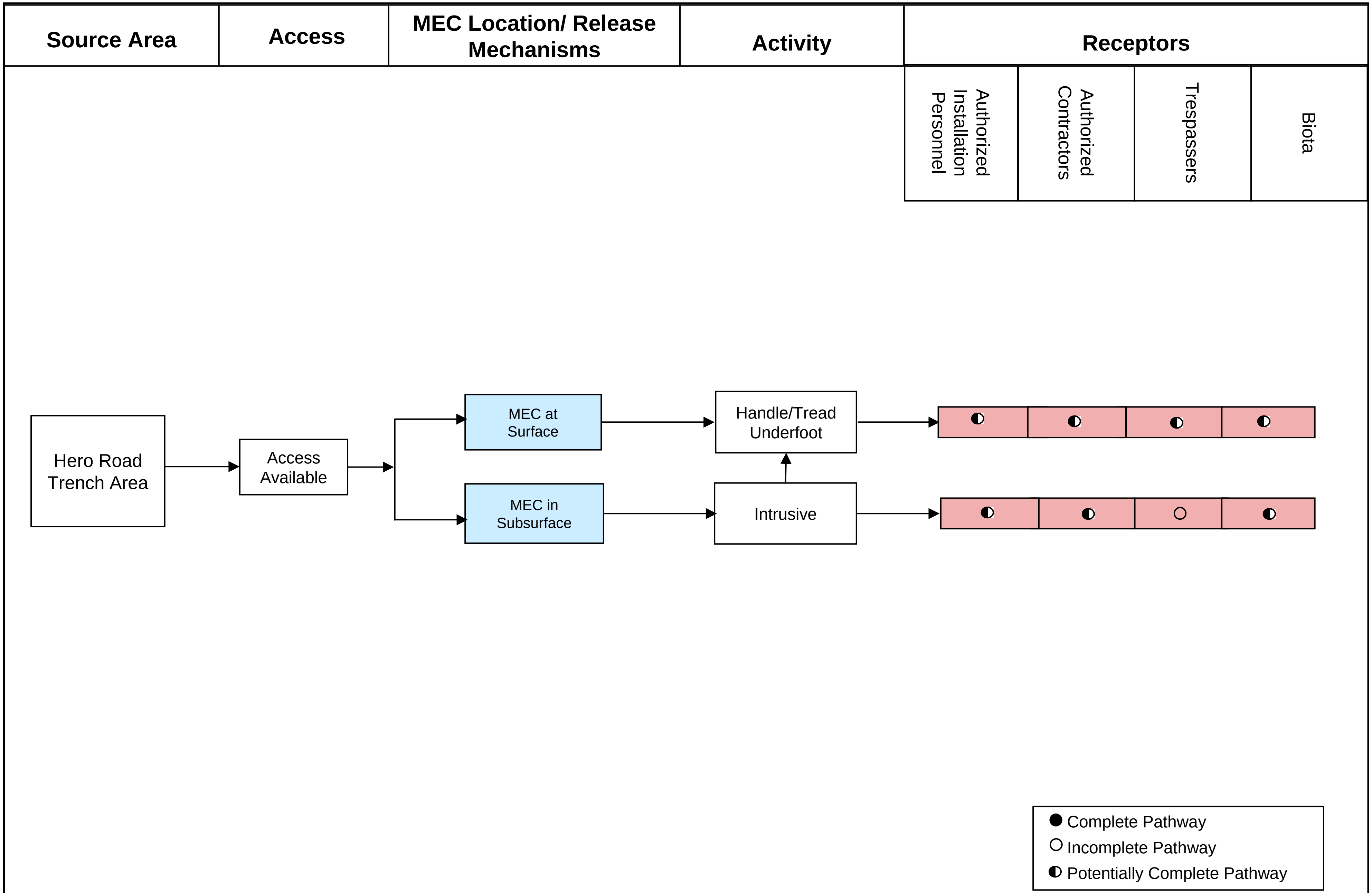
Precipitation infiltration may provide for contaminant mobility into the shallow or surficial groundwater aquifer. However, based on a review of hydrogeological data (Section 4.3.4.2.5), it is unlikely that MC in shallow groundwater would migrate to the deeper aquifers that are used as a water supply for FTSW. Receptor contact with groundwater is possible if the soil is disturbed through excavation or construction activities, creating possible migration routes/mechanisms for MC in shallow groundwater. However since only ecological screening limits were exceeded only biota have potentially complete pathways to MC in subsurface soil and/or shallow groundwater through the (incidental) ingestion and dermal contact exposure routes.

Subsurface Soil

The potential exists for MC in the subsurface soil in the Hero Road Trench Area at concentrations exceeding ecological screening limits. Ecological receptor contact with subsurface soil is possible during burrowing activities, creating possible receptor pathways to MC in subsurface soils. As such, biota have potentially complete pathways to MC in subsurface soil through the (incidental) ingestion, dermal contact, and inhalation (dust) exposure routes. All human exposure routes are incomplete based on analytical results.

Surface Soil

Based on the sampling data presented above, exposure pathways via surface soil are considered incomplete for human receptors based on analytical results. Ecological receptors within the Hero Road Trench Area may be exposed to copper, lead, and zinc in the surface soil. Therefore, the pathways to MC in surface soil through the (incidental) ingestion, dermal contact, and inhalation of dust exposure routes are potentially complete for biota.



MALCOLM PIRNIE

Prepared for:

USACE Baltimore

CONFIRMATORY SAMPLING REPORT

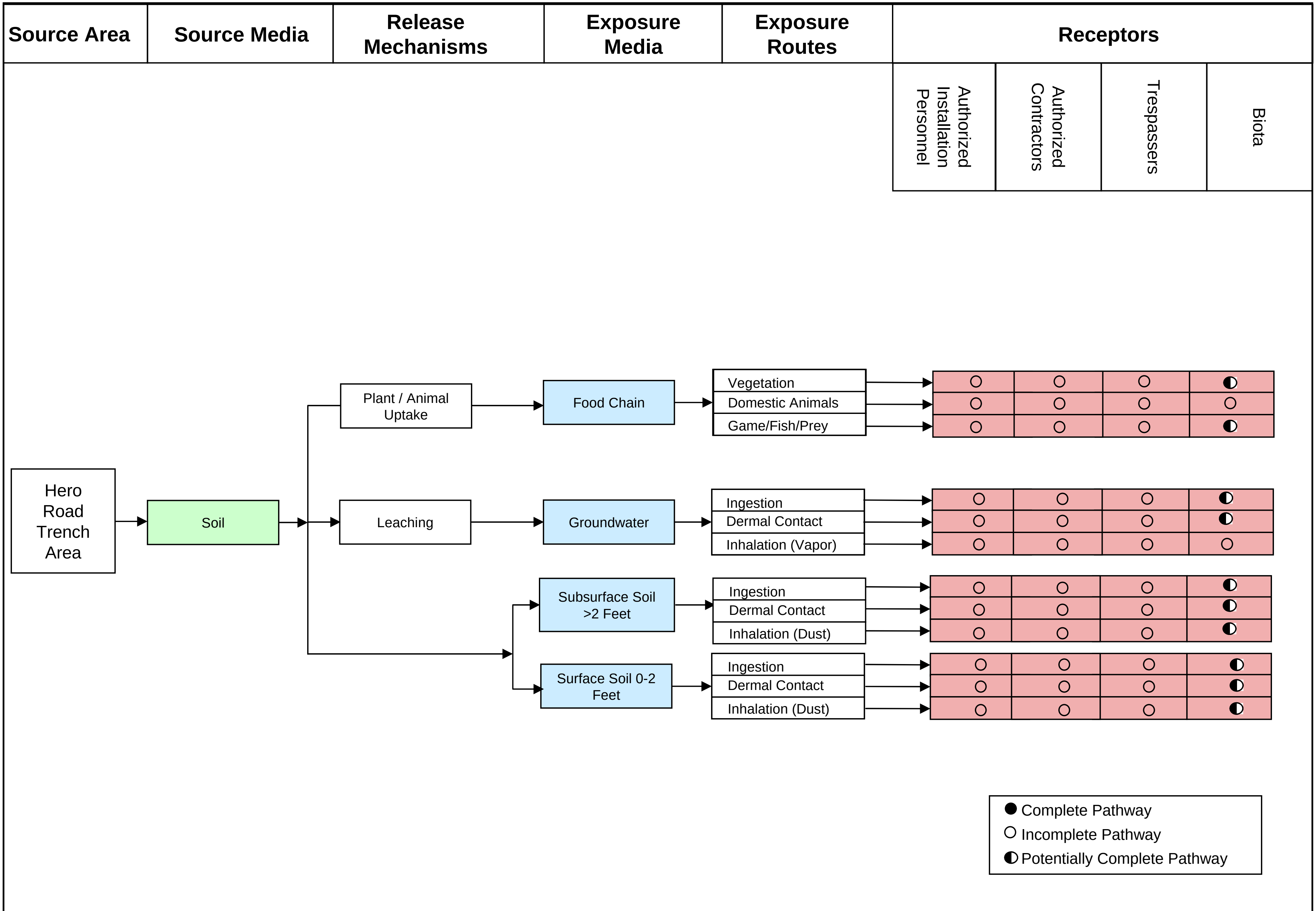
HERO ROAD TRENCH AREA – MEC EXPOSURE PATHWAY ANALYSIS

FORT STEWART, GEORGIA

MALCOLM PIRNIE, INC.

FIGURE 4-11

November 2007



Prepared for:

USACE Baltimore

CONFIRMATORY SAMPLING REPORT
HERO ROAD TRENCH AREA– MC EXPOSURE PATHWAY ANALYSIS
FORT STEWART, GEORGIA

MALCOLM PIRNIE, INC.

FIGURE 4-12
November 2007

4.8.5 Site Summary and Conclusions

4.8.5.1 MEC

A limited magnetometer-assisted visual survey was conducted along the perimeter of the fence line and in the non-fenced portions of the MRS. The MRS acreage was found to be 34.5-acres. The MRS contained both a northern fenced portion and a southern unfenced portion with areas of approximately 31 and 3.5 acres respectively. No MEC or munitions debris was observed; however, based on based on information presented in the HRR regarding alleged burials of Chemical Agent Identification Sets Detonation, M1, the potential for MEC to remain at the Hero Road Trench Area exist.

4.8.5.2 MC

One composite surface soil sample was collected from the Hero Road Trench Area and analyzed for aluminum, copper, zinc, lead, antimony, and explosives in order to complete the MRSPP. Based on the results of the metals analysis, no residential PRGs were exceeded and lead was the only metal detected in concentrations exceeding FTSW established background levels and Region 4 ecological screening values. No explosive compounds were detected above laboratory detection or reporting limits.

4.8.6 Site Recommendations

As agreed upon during the TPP session (documented in the TPP Meeting Minutes provided in Appendix H), this site is recommended for RFI/CMS, including the fenced and unfenced portions of the site, based on information presented in the HRR regarding alleged burials of Chemical Agent Identification Sets Detonation, M1. It is also recommended that the MMRP acreage be increased from 10 acres to 34.5 acres.

4.9 CHEMICAL DATA QUALITY ASSESSMENT

The MC data were verified by a senior chemist at Malcolm Pirnie. Data review was performed in accordance with the procedures specified in the Quality Assurance Project Plan (Malcolm Pirnie, 2004), USEPA Functional Guidelines for Inorganic and Organic Data Review, and quality control (QC) parameters set forth by the project laboratory, Analytical Laboratory Services, Inc.

Sample results were subject to a Level III data review that includes an evaluation of the following QC parameters:

- Sample preservation and temperature upon laboratory receipt
- Holding times
- Method blank contamination
- Surrogate recovery (for explosives analyses)
- Laboratory control sample recovery
- Matrix spike / matrix spike duplicate (MS/MSD) recovery and relative percent difference
- Field duplicates

The data quality for the sampling at FTSW was also measured and evaluated in terms of the following specific indicators:

- Precision
- Bias
- Representativeness
- Comparability
- Completeness
- Sensitivity

The data validation concluded that several metals required data qualification based on MS/MSD recoveries that were outside of acceptance limits. Overall, the sample analyses were completed with quality assurance and control protocols met. The data set is considered usable and meets project data quality objectives.

5 RECOMMENDATIONS REVIEW

5.1 SUMMARY OF SITE INSPECTION RECOMMENDATIONS

The recommendations for the MRSs at FTSW are presented in Table 5-1 and graphically on Map 5-1. They are based on decisions made and agreed upon during the TPP session held on February 21, 2006, the data collected during the CS field activities, and the conclusions presented in Section 4 of this report. The final site acreages are presented in Section 5.2.

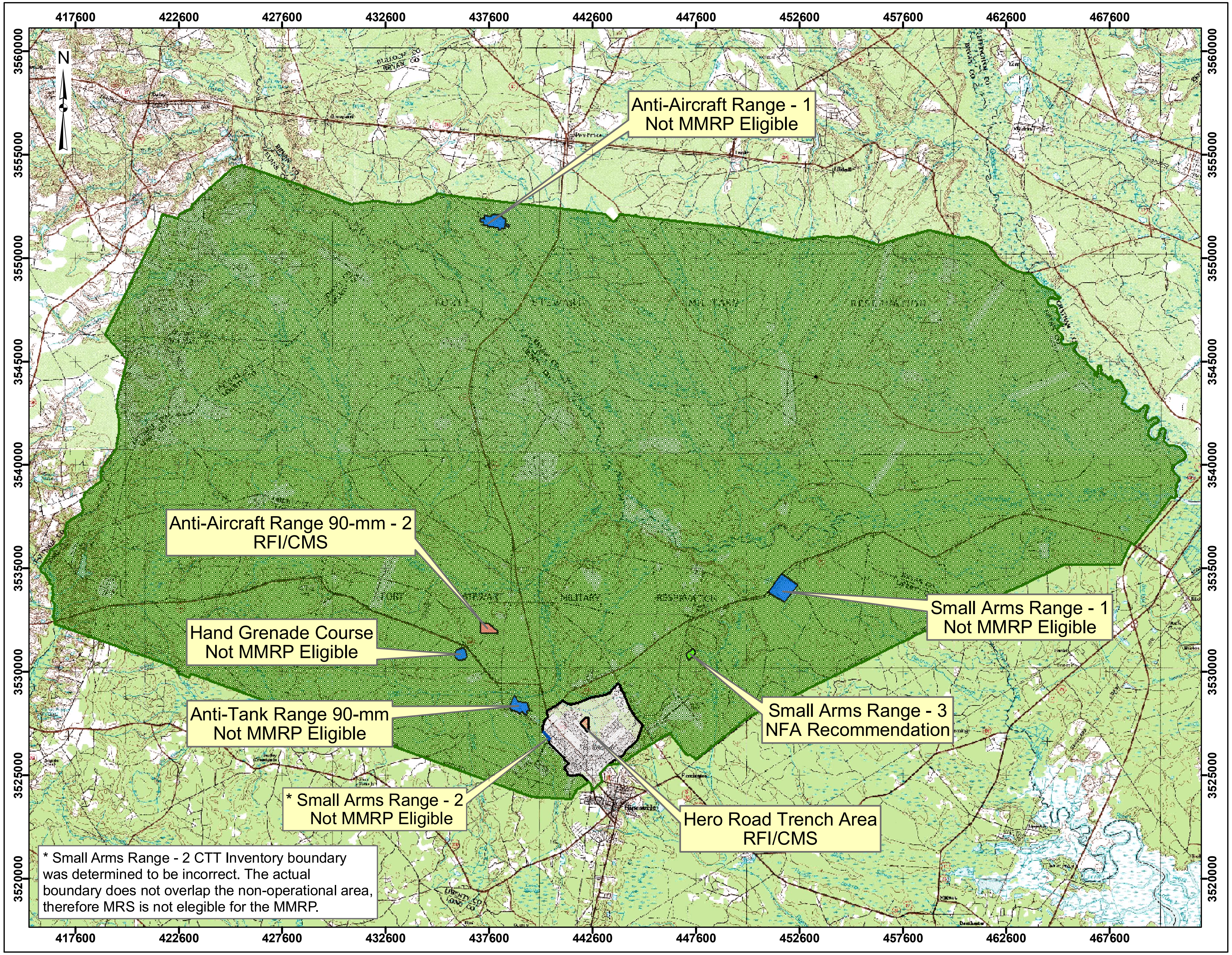
Table 5-1: Summary of CS Recommendations

MRS	CS Recommendation	Basis for Recommendation	
		MEC	MC
Anti-Aircraft Range - 1	Not eligible under the MMRP	Based on the evidence of recent munitions related training observed during the field activities this MRS is not eligible for the MMRP.	
Anti-Aircraft Range 90-mm - 2	RFI/CMS	As agreed upon during the TPP meeting, this MRS is recommended for further investigation (RFI/CMS) based on historical evidence of multiple overlapping range fans and multiple explosive ordnance disposal calls.	
Anti-Tank Range 90-mm	Not eligible under the MMRP	As agreed upon during the TPP meeting, this MRS is not eligible for the MMRP because it is currently being monitored under the RCRA landfill permit. It is recommended that this MRS continue to be monitored under RCRA.	
Hand Grenade Course	Not eligible under the MMRP	Based on information obtained from the Range Control Range Officer, the Hand Grenade Course is located within the footprint of an operational small arms range impact area and as such this MRS is not eligible under the MMRP.	
Small Arms Range - 1	Not eligible under the MMRP	Based on the evidence of recent munitions related training observed during the field activities this MRS is not eligible for the MMRP.	
Small Arms Range - 3	NFA	Recommend NFA based on historical evidence that only small arms were used on site.	Recommend NFA based on analytical results of soil samples not exceeding the FTSW background values for inorganic compounds. Additionally, the analytical results of sediment and surface water samples did not exceed selected screening criteria.
Hero Road Trench Area	RFI/CMS	As agreed upon during the TPP meeting, this MRS is recommended for further investigation (RFI/CMS) based on information presented in the HRR regarding alleged burials of Chemical Agent Identification Sets Detonation, M1.	

5.2 RATIONALE FOR FINAL ACREAGE

Table 5-2: Final Acreage Rationale

MRS	AEDB-R ID	Phase 3 Range Inventory Acreage	HRR Acreage	CS Acreage	Rationale for Change
Anti-Aircraft Range – 1	FTSW-001-R-01	42	42	0	NFA under MMRP –Operational Range Area
Anti-Aircraft Range 90-mm - 2	FTSW-002-R-01	77	77	77	No Change – Further Investigation Recommended
Anti-Tank Range 90-mm	FTSW-003-R-01	124	124	0	NFA under MMRP – Monitor Under RCRA
Hand Grenade Course	FTSW-004-R-01	67	67	0	NFA under MMRP – Operational Range Area
Small Arms Range - 1	FTSW-005-R-01	136	136	0	NFA under MMRP –Operational Range Area
Small Arms Range - 2	FTSW-006-R-01	4	0	0	Not Eligible for MMRP
Small Arms Range - 3	FTSW-007-R-01	32	32	0	NFA
Hero Road Trench Area	FTSW-008-R-01	N/A	10	34.5	Increase in acreage due to field observation of MRS acreage and boundaries. – Further Investigation Recommended



Confimatory Sampling Report
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Map 5-1
MEC/MC Recommendations

Legend

Installation Boundary

Military Range Area

Operational Range Area

Non Range, Non UXO-DMM-MC Area

Site Recommendation

NFA

Not MMRP Eligible

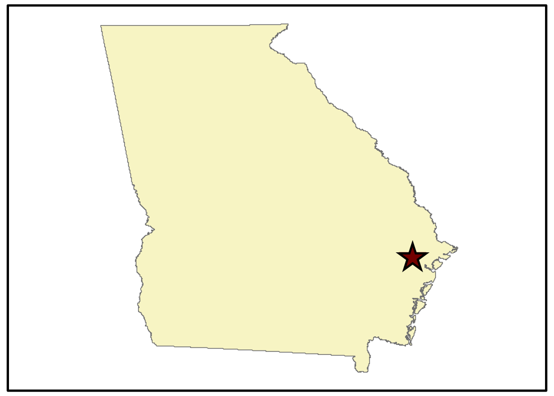
RFI/CMS

0 2,750 5,500 8,250 11,000 Meters

Data Source: Fort Stewart, GA

Coordinate System: UTM Zone 17N
Datum: NAD 83
Units: Meters

Contract: DACA31-00-D-0043
Edition: Final Confimatory Sampling Report
Date: November 2007



6 REFERENCES

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Appendix A: Field Notes

Day 1 Fort Stewart 3-13-07

7:00 am
Breakfast Mtg in lobby
Introductions

8:00 am On post visit police station to get map. We were directed to reality office

8:15 am Visit Environmental office

8:40 am Visit First Site
Anti Aircraft Range 1

8:45 am Dan Hains conducts tailgate mtg
photo 1 Safety Tailgate mtg

Weather Sunny 60's in am
pics 2-6 7.62, 556 mm blank
50 mm
Smoke Grenade
Pop Flare
90 mm Shell Casing

Randy Powell
Jones
912 767-6577

placed Flags 40 ft apart to make walking paths.
M72 sub caliber rocket range Four hundred

Site Sketch 3-13-07

Phase II land Nav day & night course

5-13-07

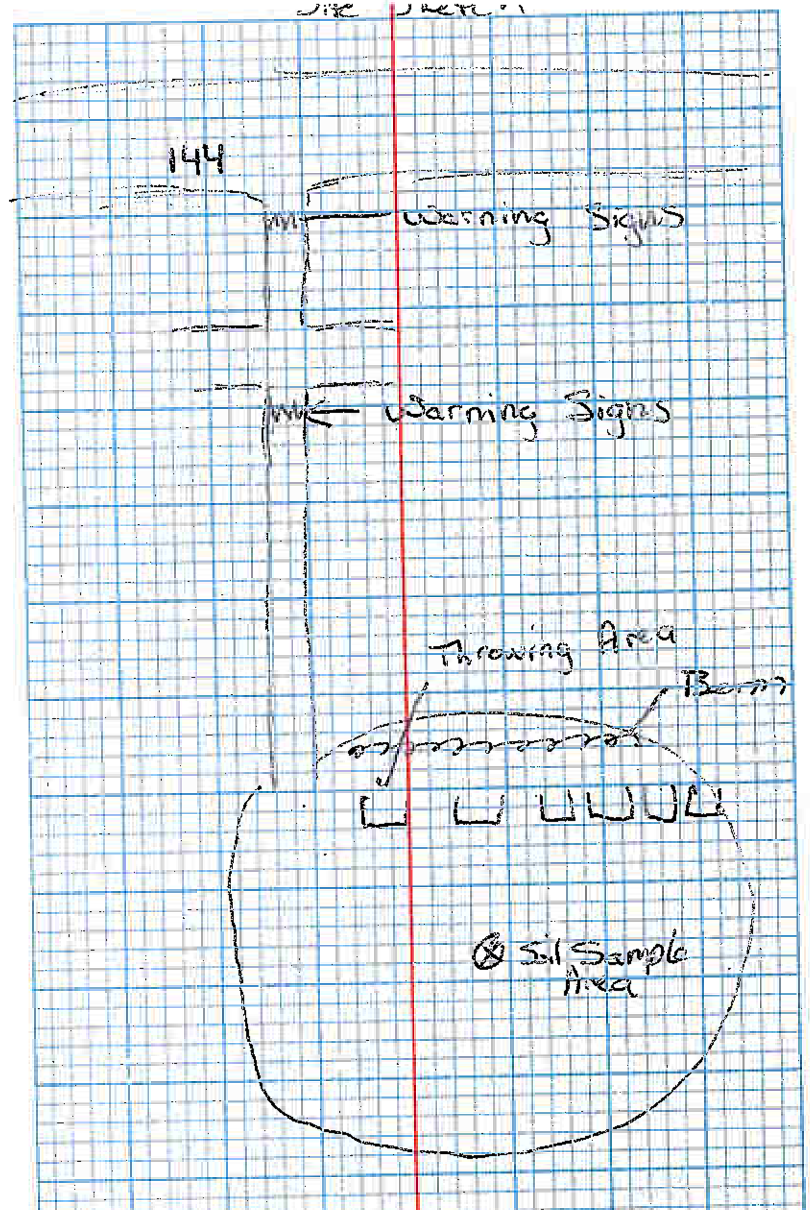
Hand Grenade Course

Weather: 74° F Sunny

1:45 Visit 2nd Site: Hand Grenade Course
Anomalie avoidance walk to confirm
site identity

take 1 Sample at specified
WP location tested for
Sb, Cu, Pb, Al, Zn & Explosives
Sample # FTSW-HGC-01
Depth 0-6 inches
Time 13:55

Site Sketch



Not To Scale

3-13-07

Visit 3rd Site Anti Air Craft 90 mm - 2

Weather: 74°F Sunny

3:00 1 Sample

Sb, Cu, Pb, Al, Zn & Explos

Sample # FTSW-AA90MM2-A02

Depth 0-6 in

Time 1300

5

Site Sketch 3-13-07

6

3-13-07

Anti AirCraft Range 2

Return at 15:55
instructed collect 2 bias samples avoiding recent munitions debris on the discovered subcaliber/rocket range and 2 random samples on the rest of the site

Depth	Sample #	Time	Analysis
0-6in	FTSW-AA1-03	16:05	Al Sb Cu Zn Pb Explosives
	FTSW-AA1-03D	16:05	
	FTSW-AA1-04	16:30	
	FTSW-AA1-04MS	16:30	
	FTSW-AA1-04MSD	16:30	
	FTSW-AA1-05	~~17~~ 16:45	
	FTSW-AA1-06	17:00	
	~~FTSW-AA~~		

Leave Installation 17:30

3-13-07

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4-3
Show big
65-75

Day 2 3-14-07

Weather: Partial High Clouds High of 83

7:45 Morning Meeting at Hotel
GPS charger is not working
must find a charger or
different device to use.

8:15 Arrive at Ft Stewart Env.
office to see if a GPS
unit is available.
They had an additional charger
so we charged our unit

9:30 First Site Visited
Small Arms Range 1
Flags were put into place
for visual survey paths after
the safety tailgate mtg.

10:30 Arrive at Army Environmental
Center to pick-up GIS and
meet Algeana to escort her to
the site. (pass trouble at the
gate set us back 30 mins)

3-14-07

14:10 Sample 07 at SA1
FTSW-SA1-07

been finding lots of change
belts cans bottle caps
no bullets. We have found
recent blanks ammo

14:50 Sample FTSW-SA1-08
Collected near a recent
blank reflecting the past
10 yrs of training

15:45 Sample FTSW-SA1-09
Collected in the location of
M143 Pop Flair

16:05 Sample FTSW-SA1-10
Collected Randomly after
walking the entire site for
biased locations

Day 2 3-14-07

16:30 Site 2; Small Arms
Range 3

Calibrate Horiba 10
Decon Echman Dredge

17:15 Surface Water Sample FTSW-SA3-SW01

17:45 Sediment Samples
FTSW-SA3 -SD02
FTSW-SA3 -SD02-MS
FTSW-SA3 -SD02-MSD
1800 FTSW-SA3 -SD01-D
FTSW-SA3 -SD01

Tomorrow
SA1 → Walk Lanes GPS soil samples

SA3 → Walk Lanes GPS SW & SD Sample
Collect 4 Soil Samples

HAT → Walk Site & Take 1 Sample
GPS

18:45 Leave Site

3-14-07

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Day 3 3-15-07

10:45 Arrived on post

11:00 Hero Road Trench Area

Walk Site in random path on unFenced portion

Collect soil sample
FTSW - HRT - 1Ø

Whites malFunction had to drive to SA1 to get a replacement

1300 Return to SA1 and collect gps & walk lanes

lanes were very hard to Follow b/c of dense woods swamps and a Fenced in former petroleum area

14:30 Return to SA3

Began Flagging & walking Paths

Soil Samples taken as noted in the WP

3-22-02

DAY 1 : Fort Foote MD

Sunny
High 79
No wind

700 Leave Baltimore
815 Ice Stop
830 Arrive On-site
845 Safety Brief

9:10 SS09
9:20 SS10
9:38 SS08
9:50 SS07
10:05 SS06
10:35 SS04
10:50 SS05
11:25 SS03
11:35 SS02
11:45 SS01

LIMS #
20415

12:00 Collect 4 pts for archeologist

12:45 Finish Paperwork

1:45 Leave Site

Appendix B: Field Forms and Photographic Log

MALCOLM PIRNIE

SITE INVESTIGATION PHOTOGRAPHIC LOG

Installation Name: Fort Stewart

Site Name: Anti-Aircraft Range - 1

Location: Fort Stewart, GA

Photo No. 001

Date:

Location of Photo: NCO Academy

Direction Facing: **West**

Description: Grid layout for surface walk looking towards the Rocket Range

MALCOLM PIRNIE

SITE INVESTIGATION PHOTOGRAPHIC LOG

Installation Name: Fort Stewart

Site Name: Anti-Aircraft Range - 1

Location:

Photo No. 002

Date:

Location of Photo: NCO Academy

Direction Facing: **West North West**

Description: Grid layout, surface walk facing west north west, Rocket Range is to the left in this photo

SITE INVESTIGATION PHOTOGRAPHIC LOG

Installation Name:	Site Name:	Location:
Fort Stewart	Anti-Aircraft Range - 1	

Photo No.	Date:
003	

Location of Photo:
NCO Academy

Direction Facing:
Not Applicable

Description:
Simulator Booby Trap, Whistling M119 found during surface walk

SITE INVESTIGATION PHOTOGRAPHIC LOG

Installation Name:	Site Name:	Location:
Fort Stewart	Anti-Aircraft Range - 1	Fort Stewart, GA

Photo No.	Date:
004	

Location of Photo:
NCO Academy

Direction Facing:
South

Description:
Equipment Check out and calibration.

SITE INVESTIGATION PHOTOGRAPHIC LOG

Installation Name:	Site Name:	Location:
Fort Stewart	Anti-Aircraft Range - 1	Fort Stewart, GA

Photo No.	Date:
002	

Location of Photo:
Former Rocket Range

Direction Facing:
West North West

Description:
Rocket Range facing west north west from the firing berm

SITE INVESTIGATION PHOTOGRAPHIC LOG

Installation Name:	Site Name:	Location:
Fort Stewart	Anti-Aircraft Range - 1	Fort Stewart, GA

Photo No.	Date:
003	

Location of Photo:
Former Rocket Range

Direction Facing:
West

Description:
Site of former target with expended M 73 sub-caliber rockets

SITE INVESTIGATION PHOTOGRAPHIC LOG

Installation Name: Fort Stewart

Site Name: Anti-Aircraft Range - 1

Location: Fort Stewart, GA

Photo No. 004

Date:

Location of Photo: Former Rocket range

Direction Facing: **West North West**

Description: Expended .30 caliber blank cartridge

SITE INVESTIGATION PHOTOGRAPHIC LOG

Installation Name: Fort Stewart

Site Name: Anti-Aircraft Range - 1

Location: Fort Stewart, GA

Photo No. 005

Date:

Location of Photo: Former Rocket Range

Direction Facing: West

Description: Expended M18 Smoke Grenade (Yellow)

SITE INVESTIGATION PHOTOGRAPHIC LOG

Installation Name:	Site Name:	Location:
Fort Stewart	Anti-Aircraft Range - 1	Fort Stewart, GA

Photo No. 006	**Date:**
Location of Photo: Former Rocket Range	
Direction Facing: Non Applicable	
Description: Expended M125A1 pop flare	

SITE INVESTIGATION PHOTOGRAPHIC LOG

Installation Name:		Site Name:	Location:
Fort Stewart		Anti-Aircraft Range 90 mm	Fort Stewart, GA
Photo No. 001	**Date:**		

Location of Photo:
ASP

Direction Facing:
North West

Description:
Site Survey at ASP

SITE INVESTIGATION PHOTOGRAPHIC LOG

Installation Name:		Site Name:	Location:
Fort Stewart		Anti-Aircraft Range 90 mm	Fort Stewart, GA
Photo No. 002	**Date:**		

Location of Photo:
ASP

Direction Facing:
North

Description:
Soil Sampling Point

SITE INVESTIGATION PHOTOGRAPHIC LOG

Installation Name:	Site Name:	Location:
Fort Stewart	Anti-Aircraft Range 90 mm	Fort Stewart, GA

Photo No.	Date:
003	

Location of Photo:
ASP

Direction Facing:
Non Applicable

Description:

Soil Sampling – sample homogenization

SITE INVESTIGATION PHOTOGRAPHIC LOG

Installation Name:	Site Name:	Location:
Fort Stewart	Anti-Aircraft Range 90 mm	Fort Stewart, GA

Photo No.	Date:
004	

Location of Photo:
ASP

Direction Facing:
North

Description:
Soil Sampling with storage/maintenance facilities in background

SITE INVESTIGATION PHOTOGRAPHIC LOG

Installation Name:	Site Name:	Location:
Fort Stewart	Hand Grenade Course	Fort Stewart, GA.

Photo No.	Date:
001	

Location of Photo:
Grenade Range

Direction Facing:
South West

Description:
Dirt road leading into the Grenade Range from SR 144

SITE INVESTIGATION PHOTOGRAPHIC LOG

Installation Name:	Site Name:	Location:
Fort Stewart	Hand Grenade Course	Fort Stewart, GA.

Photo No.	Date:
002	

Location of Photo:
Grenade Range

Direction Facing:
South West

Description:
Soil sampling location at the Grenade Range

SITE INVESTIGATION PHOTOGRAPHIC LOG

Installation Name:	Site Name:	Location:
Fort Stewart	Hand Grenade Course	Fort Stewart, GA.

Photo No. 003 **Date:**

Location of Photo: Grenade Range

Direction Facing: South West

Description: Soil sampling location as seen from throwing pit at the Grenade Range

SITE INVESTIGATION PHOTOGRAPHIC LOG

Installation Name:	Site Name:	Location:
Fort Stewart	Hand Grenade Course	Fort Stewart, GA.

Photo No. 004 **Date:**

Location of Photo: Grenade Range

Direction Facing: North East

Description: Grenade throwing positions at former Grenade Range

SITE INVESTIGATION PHOTOGRAPHIC LOG

Installation Name:	Site Name:	Location:
Fort Stewart	Small Arms Range 1	Fort Stewart, GA

Photo No.	Date:
001	

Location of Photo:
Former Small Arms Range

Direction Facing:
South East

Description:
Access road to former helicopter Field, facing south east

SITE INVESTIGATION PHOTOGRAPHIC LOG

Installation Name:	Site Name:	Location:
Fort Stewart	Small Arms Range 1	Fort Stewart, GA

Photo No.	Date:
002	

Location of Photo:
Drainage Ditch, Former Small Arms Range

Direction Facing:
West South West

Description:
Soil sample location, former Small Arms Range,

MALCOLM PIRNIE

SITE INVESTIGATION PHOTOGRAPHIC LOG

Installation Name:	Site Name:	Location:
Fort Stewart	Small Arms Range 1	Fort Stewart, GA

Photo No. 003

Date:

Location of Photo: Former Small Arms Range

Direction Facing: East North East

Description: Soil sampling site and magnetometer assisted surface survey site.

MALCOLM PIRNIE

SITE INVESTIGATION PHOTOGRAPHIC LOG

Installation Name:	Site Name:	Location:
Fort Stewart	Small Arms Range 1	Fort Stewart, GA

Photo No. 004

Date:

Location of Photo: Former Small Arms

Direction Facing: North West

Description: Helicopter Field Access road crossing the former Small Arms Range

SITE INVESTIGATION PHOTOGRAPHIC LOG

Installation Name:	Site Name:	Location:
Fort Stewart	Small Arms Range 1	Fort Stewart, GA

Photo No.	Date:
005	

Location of Photo:
Former Small Arms Range

Direction Facing:
North East

Description:
Magnetometer assisted surface survey

SITE INVESTIGATION PHOTOGRAPHIC LOG

Installation Name:	Site Name:	Location:
Fort Stewart	Small Arms Range 1	Fort Stewart, GA

Photo No.	Date:
006	

Location of Photo:
Former Small Arms Range

Direction Facing:
North East

Description:
Soil Sampling site former Small Arms Range

SITE INVESTIGATION PHOTOGRAPHIC LOG

Installation Name:	**Site Name:**	**Location:**
Fort Stewart	Small Arms Range 1	Fort Stewart, GA

Photo No.	**Date:**
007	

Location of Photo:
Former Small Arms Range

Direction Facing:
South West

Description:
Magnetometer assisted surface survey

SITE INVESTIGATION PHOTOGRAPHIC LOG

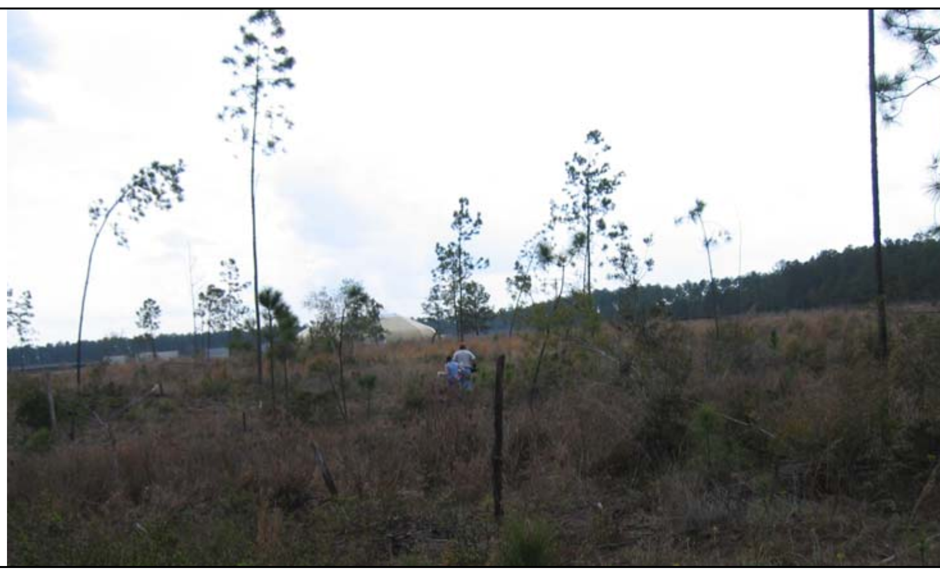
Installation Name:	**Site Name:**	**Location:**
Fort Stewart	Small Arms Range 1	Fort Stewart, GA

Photo No.	**Date:**
008	

Location of Photo:
Former Small Arms Range

Direction Facing:
South West

Description:
Magnetometer assisted surface survey



SITE INVESTIGATION PHOTOGRAPHIC LOG

Installation Name:	Site Name:	Location:
Fort Stewart	Small Arms Range 3	Fort Stewart, GA

Photo No. 001 **Date:**

Location of Photo:
Pond

Direction Facing:
North East

Description:
Survey Site setup

SITE INVESTIGATION PHOTOGRAPHIC LOG

Installation Name:	Site Name:	Location:
Fort Stewart	Small Arms Range 3	Fort Stewart, GA

Photo No. 002 **Date:**

Location of Photo:
Pond Shore

Direction Facing:
North

Description:

Water Sample Location

SITE INVESTIGATION PHOTOGRAPHIC LOG

Installation Name:	Site Name:	Location:
Fort Stewart	Small Arms Range 3	Fort Stewart, GA

Photo No.	Date:
003	

Location of Photo:
Pond

Direction Facing:
North

Description:
Taking water samples

SITE INVESTIGATION PHOTOGRAPHIC LOG

Installation Name:	Site Name:	Location:
Fort Stewart	Small Arms Range 3	Fort Stewart, GA

Photo No.	Date:
004	

Location of Photo:
Pond

Direction Facing:
South

Description:
De-contamination of sediment sampling equipment

SITE INVESTIGATION PHOTOGRAPHIC LOG

Installation Name:	Site Name:	Location:
Fort Stewart	Small Arms Range 3	Fort Stewart, GA

Photo No.	Date:
005	

Location of Photo:
West shore of Pond

Direction Facing:
North East

Description:
Sediment Sampling

SITE INVESTIGATION PHOTOGRAPHIC LOG

Installation Name:	Site Name:	Location:
Fort Stewart	Small Arms Range 3	Fort Stewart, GA

Photo No.	Date:
006	

Location of Photo:
Pond

Direction Facing:
South East

Description:
Setup for water sampling

SITE INVESTIGATION PHOTOGRAPHIC LOG

Installation Name:	Site Name:	Location:
Fort Stewart	Hero Road Trench Area	Fort Stewart, GA

Photo No. 001 **Date:**

Location of Photo: Former Landfill

Direction Facing: West

Description: Former Landfill area, showing suspected mounds

SITE INVESTIGATION PHOTOGRAPHIC LOG

Installation Name:	Site Name:	Location:
Fort Stewart	Hero Road Trench Area	Fort Stewart, GA

Photo No. 002 **Date:**

Location of Photo:

Direction Facing: West South West

Description: Suspected mound in former landfill area

SITE INVESTIGATION PHOTOGRAPHIC LOG

Installation Name:	Site Name:	Location:
Fort Stewart	Hero Road Trench Area	Fort Stewart, GA

Photo No.	Date:
003	

Location of Photo:
Former Landfill area

Direction Facing:
North West

Description:
Ravine where soil samples were taken

SITE INVESTIGATION PHOTOGRAPHIC LOG

Installation Name:	Site Name:	Location:
Fort Stewart	Hero Road Trench Area	Fort Stewart, GA

Photo No.	Date:
004	

Location of Photo:
Former Landfill Area

Direction Facing:
North

Description:
GPS of suspected mounds in former landfill area.

Figure 10- 1: Daily Quality Control Report

MMRP: (Installation name)
DAILY QUALITY CONTROL REPORT

USACE PROJECT MGR. Kim Gross

PROJECT Fort Stewart

JOB NO. 2118 - 093

CONTRACT NO. W912 DR- 05 -D- 0004

DAY	S	M	T	W	TH	F	S

WEATHER	BRIGHT SUN	CLEAR	OVERCAST	RAIN	SNOW
TEMPERATURE	<32	32 - 50	50 - 70	70-85	>85
WIND	STILL	MODERATE	HIGH	REPORT NO	
HUMIDITY	DRY	MODERATE	HUMID	1	

SUBCONTRACTORS ON-SITE: NONE

EQUIPMENT ON SITE: Sampling Bottleware, Plastic Scoops, Plastic Sheeting, Nitrile Gloves Handheld GPS Unit, Whites all metals detector, Schonstedt Magnetometer, Digital Camera, 100ft Tape Measure, Marking Flags

WORK PERFORMED (INCLUDING SAMPLING): Conducted visual survey on Anti-Aircraft Range 1 and collected 4 soil samples. Limited visual survey and collected 1 sample at the Grenade Course and the Anti-Aircraft Range 90-mm-2.

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS): Schonstedt and Whites metal detectors were tested against known items. Duplicate, MS & MSD samples were collected for analytical QC.

HEALTH AND SAFETY LEVELS AND ACTIVITIES: Safety Tailgate Meeting in the morning Site Specific Safety brief at each site upon arrival

PROBLEMS ENCOUNTERED/CORRECTIVE ACTION TAKEN: GPS unit will not hold charge background data, wouldn't load onto GPS unit. A new GPS unit was shipped from Tampa office. Proposed transects were measured with tape and walked without background data on the GPS Unit.

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS: Conduct visual survey and collect samples at Small Arms Ranges 1 and 3.

BY David Smith TITLE Environmental Engineer I

Figure 10- 1: Daily Quality Control Report

MMRP: (Installation name)
DAILY QUALITY CONTROL REPORT

USACE PROJECT MGR. Kim Gross

PROJECT Fort Stewart

JOB NO. 2118-093

CONTRACT NO. W912DR-05-D-0004

DAY	S	M	T	W	TH	F	S

WEATHER	BRIGHT SUN	CLEAR	OVERCAST	RAIN	SNOW
TEMPERATURE	< 32	32 - 50	50 - 70	70-85	>85
WIND	STILL	MODERATE	HIGH	REPORT NO	
HUMIDITY	DRY	MODERATE	HUMID	2	

SUBCONTRACTORS ON-SITE: NONE

EQUIPMENT ON SITE: Soil sampling Equipment, Ekman Dredge, Horiba 10 Water Quality Meter Surface Water Sampling Equipment, GPS unit, Metal detectors (Whites, Schonstedt) 100' tape measure, Pin Flags, Camera

WORK PERFORMED (INCLUDING SAMPLING): Conducted Visual Survey and collected Samples at Small Arms Range 1 and 3

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS): Schonstedt and Whites tested against Known objects

HEALTH AND SAFETY LEVELS AND ACTIVITIES: Safety Tailgate Meeting. Site Specific Safety brief upon arrival at each site.

PROBLEMS ENCOUNTERED/CORRECTIVE ACTION TAKEN: GPS unit only had enough charge to take sample points if we wanted it to last all day. Visual Survey transects will be recorded Tommorow for Small Arm Ranges 1 & 3.

SPECIAL NOTES: GPS unit arrives from TAMPA office in the AM tomorrow.

TOMORROW'S EXPECTATIONS: ~~Visit~~ Conduct Sampling & Visual Survey at Hero Road Trench Return to Small arms range 1 & Small arms Range 3 to complete visual survey.

BY David Smith TITLE Environmental Engineer I

Figure 10- 1: Daily Quality Control Report

MMRP: (Installation name)
DAILY QUALITY CONTROL REPORT

DAY	S	M	T	W	TH	F	S

WEATHER	BRIGHT SUN	CLEAR	OVERCAST	RAIN	SNOW
TEMPERATURE	<32	32 - 50	50 - 70	70-85	>85
WIND	STILL	MODERATE	HIGH	REPORT NO	
HUMIDITY	DRY	MODERATE	HUMID	3	

USACE PROJECT MGR. Kim Gross

PROJECT Fort Stewart

JOB NO. 2118-093

CONTRACT NO. W912DR-05-D-0004

SUBCONTRACTORS ON-SITE:
NONE

EQUIPMENT ON SITE: GPS Unit, Soil Sampling Equipment, Digital Camera
Whites Metal Detector, Schonstedt Magnetometer

WORK PERFORMED (INCLUDING SAMPLING): Conducted Site Visual Surveys
at Small Arms Ranges 1 & 3 inorder to record transects on GPS
Conduct sampling and Visual Survey on Hero Road Trench
Area

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):
Metal Detectors tested against Known objects

HEALTH AND SAFETY LEVELS AND ACTIVITIES: Site Safety Tailgate Meeting

PROBLEMS ENCOUNTERED/CORRECTIVE ACTION TAKEN:
Whites Magnetometer wasn't working contacted dealer and
found a near by location to purchase a new one

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS:
Demobilization

BY David Smith TITLE Environmental Engineer I

SITE SAFETY TAILGATE MEETING

MALCOLM PIRNIE

PROJECT NAME:	Ft Stewart SI	**CLIENT NAME:**	Ft. Stewart, GA.
PROJECT NUMBER:	2118093	**FIELD PROJECT LEADER:**	Shelly Kolb
PREPARED BY:	Dan S. Hains	**DATE:** 3/13/07	

ON-SITE SAFETY MEETING RECORD	
LOCATION: Ft. Stewart, GA	
TASK TO BE PERFORMED: Site Inspection	
I. Purpose for meeting: (check all that apply)	
	DAILY SAFETY BRIEFING
	Begin New Task. Task:
	Periodic Safety Meeting
	New Site Procedures
	New Site Conditions / Information
	New Site Workers

MEETING ATTENDEES:

NAME (Print)	SIGNATURE	COMPANY
1. Dan S. Hains	Dan S. Hains	Malcolm Pirnie Inc.
2. Shelly Kolb	Shelly Kolb	Malcolm Pirnie Inc.
3. David Smith	David Smith	Malcolm Pirnie Inc.
4. Nicole Ukura	Nicole Ukura	Malcolm Pirnie Inc.
5.		

ON-SITE SAFETY MEETING RECORD

II. Topic (check all that apply)

✓	Site Safety Personnel	✓	Decontamination
✓	Work Area Description	✓	Emergency Response
✓	Site Characterization	✓	Hazard Communication
✓	Equipment Hazard(s)	✓	On-site Emergency
✓	Biological Hazard(s)	✓	On-site Injuries
✓	Chemical Hazard(s)	✓	Evacuation Procedures
✓	Physical Hazard(s)	✓	Rally Point
✓	Heat Stress	✓	Emergency Communications
✓	Cold Stress	✓	Directions to Hospital
✓	Site Control		Emergency Equipment
✓	Work and Support Zones	✓	Drug and Alcohol Policies
✓	PPE	✓	Medical Monitoring
X	Air Monitoring	✓	Task Training
✓	Safe Work Practices	✓	Unexploded Ordnance (UXO)

III. Remarks

V. Verification

I certify that the personnel listed on this roster received the briefing described above. Site personnel not attending this meeting will be briefed before beginning their assigned duties.

Field Project Manager — Date: 3/13/07

UXO Safety Supervisor — Date: 3/13/07

SITE SAFETY TAILGATE MEETING

MALCOLM PIRNIE

PROJECT NAME:	Ft Stewart SI	**CLIENT NAME:**	Ft. Stewart, GA.
PROJECT NUMBER:	2118093	**FIELD PROJECT LEADER:**	Shelly Kolb
PREPARED BY:	Dan S. Hains	**DATE:** 3/14/07	Shelly Kolb

ON-SITE SAFETY MEETING RECORD
LOCATION: Ft. Stewart, GA
TASK TO BE PERFORMED: Site Inspection
I. Purpose for meeting: (check all that apply)

	DAILY SAFETY BRIEFING
	Begin New Task. Task:
	Periodic Safety Meeting
	New Site Procedures
	New Site Conditions / Information
	New Site Workers

MEETING ATTENDEES:

NAME (Print)	SIGNATURE	COMPANY
1. Dan S. Hains	[signature]	Malcolm Pirnie Inc.
2. Shelly Kolb	[signature]	Malcolm Pirnie Inc.
3. David Smith	David Smith	Malcolm Pirnie Inc.
4. Nicole Ukura	[signature]	Malcolm Pirnie Inc.
5.		

ON-SITE SAFETY MEETING RECORD

II. Topic (check all that apply)

✓	Site Safety Personnel		Decontamination
✓	Work Area Description	✓	Emergency Response
✓	Site Characterization	✓	Hazard Communication
✓	Equipment Hazard(s)	✓	On-site Emergency
✓	Biological Hazard(s)	✓	On-site Injuries
✓	Chemical Hazard(s)	✓	Evacuation Procedures
✓	Physical Hazard(s)	✓	Rally Point
✓	Heat Stress	✓	Emergency Communications
	Cold Stress	✓	Directions to Hospital
✓	Site Control		Emergency Equipment
	Work and Support Zones	✓	Drug and Alcohol Policies
✓	PPE	✓	Medical Monitoring
	Air Monitoring		Task Training
✓	Safe Work Practices	✓	Unexploded Ordnance (UXO)

III. Remarks

V. Verification

I certify that the personnel listed on this roster received the briefing described above. Site personnel not attending this meeting will be briefed before beginning their assigned duties.

Field Project Manager 3/14/07
Date

UXO Safety Supervisor 3/14/07
Date

SITE SAFETY TAILGATE MEETING

MALCOLM PIRNIE

PROJECT NAME:	Ft Stewart SI	CLIENT NAME:	Ft. Stewart, GA.
PROJECT NUMBER:	2118093	FIELD PROJECT LEADER:	Shelly Kolb
PREPARED BY:	Dan S. Hains	DATE: 3/15/07	

ON-SITE SAFETY MEETING RECORD	
LOCATION: Ft. Stewart, GA	
TASK TO BE PERFORMED: Site Inspection	
I. Purpose for meeting: (check all that apply)	
✓	**DAILY SAFETY BRIEFING**
	Begin New Task. Task:
	Periodic Safety Meeting
	New Site Procedures
	New Site Conditions / Information
	New Site Workers

MEETING ATTENDEES:

NAME (Print)	SIGNATURE	COMPANY
1. Dan S. Hains	[signature]	Malcolm Pirnie Inc.
2. Shelly Kolb	[signature]	Malcolm Pirnie Inc.
3. David Smith	[signature]	Malcolm Pirnie Inc.
4. Nicole Ukura	[signature]	Malcolm Pirnie Inc.
5.		

ON-SITE SAFETY MEETING RECORD

II. Topic (check all that apply)

✓	Site Safety Personnel	✓	Decontamination
✓	Work Area Description	✓	Emergency Response
✓	Site Characterization	✓	Hazard Communication
✓	Equipment Hazard(s)	✓	On-site Emergency
✓	Biological Hazard(s)	✓	On-site Injuries
✓	Chemical Hazard(s)	✓	Evacuation Procedures
✓	Physical Hazard(s)	✓	Rally Point
✓	Heat Stress	✓	Emergency Communications
	Cold Stress	✓	Directions to Hospital
✓	Site Control		Emergency Equipment
	Work and Support Zones	✓	Drug and Alcohol Policies
✓	PPE	✓	Medical Monitoring
	Air Monitoring	✓	Task Training
✓	Safe Work Practices	✓	Unexploded Ordnance (UXO)

III. Remarks

V. Verification

I certify that the personnel listed on this roster received the briefing described above. Site personnel not attending this meeting will be briefed before beginning their assigned duties.

[illegible signature] 3-15-07

Field Project Manager Date

[illegible signature] 3-15-07

UXO Safety Supervisor Date

MALCOLM PIRNIE

SOIL SAMPLING LOG

ADMINISTRATIVE DATA			
Project Number	2118093	Date	3-13-07
Project Name	Fort Stewart	Time	17:00
Site Location	Anti~~craft~~ Aircraft Range 1	Sampler(s)	David Smith
Site Contact	Algeana Stevenson	Others Present	Nick Ukcava, Shelly Kolb Dan Hains
Weather Conditions (Temperature, Wind, Humidity, Sky): 76° sunny, light breeze			

SAMPLE LOCATION DESCRIPTION	
Random / Biased (describe)	Random
Depth of Sample	0-6 inches
Location Description (GPS?)	X= 437831.39 Y = 3551755.183 Z = 24.196
Grab or Composite Sample?	Composite

SOIL SAMPLE	
Sample No.	~~F~~TSW- AA1-06
Lab Analysis Required	Explosives 8330, Al, Sb, Cu, Pb, Zn
Sample Collection Time	17:00
Sample Collection Depth	0-6 inches
Sample Collection Device	plastic shovel
Grab or Composite Sample?	Composite

SAMPLE LOG REVIEW INFORMATION
REVIEWED BY: DATE/TIME:
NOTES:

MALCOLM PIRNIE

SOIL SAMPLING LOG

ADMINISTRATIVE DATA			
Project Number	2118093	**Date**	3-13-07
Project Name	Fort Stewart	**Time**	~~1030~~ 16:45
Site Location	Anti-Aircraft Range 1	**Sampler(s)**	David Smith
Site Contact	Algeana Stevenson	**Others Present**	Nicole Ukura, Shelly Kolb Dan Hains
Weather Conditions (Temperature, Wind, Humidity, Sky): 70° sunny, light breeze			

SAMPLE LOCATION DESCRIPTION	
Random / Biased (describe)	Random
Depth of Sample	0-6 inches
Location Description (GPS?)	x = 437419.050 y = 355838.325 z 23.191
Grab or Composite Sample?	Composite
SOIL SAMPLE	
Sample No.	FTSW-AA1-05
Lab Analysis Required	Explosives 8330, Al, Sb, Cu, Pb, Zn
Sample Collection Time	16:45
Sample Collection Depth	0-6 inches
Sample Collection Device	Plastic shovel
Grab or Composite Sample?	composite

SAMPLE LOG REVIEW INFORMATION
REVIEWED BY: **DATE/TIME:**
NOTES:

MALCOLM PIRNIE

SOIL SAMPLING LOG

ADMINISTRATIVE DATA			
Project Number	2118093	**Date**	3-13-07
Project Name	Fort Stewart	**Time**	16:20
Site Location	Anti Aircraft Range-1	**Sampler(s)**	David Smith
Site Contact	Algeana Stevenson	**Others Present**	Shelly Kolb Nicole Ukura
Weather Conditions (Temperature, Wind, Humidity, Sky): Sunny 76 light breeze			

SAMPLE LOCATION DESCRIPTION	
Random / Biased (describe)	Biased
Depth of Sample	0-6 inches
Location Description (GPS?)	X=437221.401 Y=3551865.727 Z=22.549
Grab or Composite Sample?	Composite

SOIL SAMPLE	
Sample No.	FTSW-AA1-04/FTSW-AA1-04-MS/FTSW-AA1-04-MSD
Lab Analysis Required	Al, Sb, Cu, Pb, Zn, Explosives
Sample Collection Time	16:20
Sample Collection Depth	0-6 inches
Sample Collection Device	Plastic Scoop
Grab or Composite Sample?	Composite

SAMPLE LOG REVIEW INFORMATION
REVIEWED BY: **DATE/TIME:**
NOTES:

MALCOLM PIRNIE

SOIL SAMPLING LOG

ADMINISTRATIVE DATA			
Project Number	2118 093	**Date**	3-13-09
Project Name	Fort Stewart	**Time**	16:05
Site Location	Anti Air Craft Range 1	**Sampler(s)**	David Smith
Site Contact	Alezana Stevenson	**Others Present**	Nicole Ukura Shelley Cobb
Weather Conditions (Temperature, Wind, Humidity, Sky): 76 sunny light breeze			

SAMPLE LOCATION DESCRIPTION	
Random / Biased (describe)	Biased
Depth of Sample	0-6 inches
Location Description (GPS?)	X=437183.588 Y=3551880.885 Z=24.895
Grab or Composite Sample?	Composite

SOIL SAMPLE	
Sample No.	FTSW-AA1-03 / FTSW-AA1-03D
Lab Analysis Required	Al, Sb, Cu, Pb, Zn, Explosives
Sample Collection Time	16:05
Sample Collection Depth	0-6 inches
Sample Collection Device	Plastic Scoop
Grab or Composite Sample?	Composite

SAMPLE LOG REVIEW INFORMATION
REVIEWED BY: **DATE/TIME:**
NOTES:

MALCOLM PIRNIE

SOIL SAMPLING LOG

ADMINISTRATIVE DATA			
Project Number	2118093	**Date**	3-13-07
Project Name	Fort Stewart SI	**Time**	1500
Site Location	Anti-Aircraft Range 90mm-2	**Sampler(s)**	Dave Smith
Site Contact		**Others Present**	Nicole Ukura, Shelly Kolb Dan Hains
Weather Conditions (Temperature, Wind, Humidity, Sky): 74° Sunny, light breeze			

SAMPLE LOCATION DESCRIPTION	
Random / Biased (describe)	Random
Depth of Sample	0-6 inches
Location Description (GPS?)	x= 4337781.100 y= 3531997.495 z= 19.825
Grab or Composite Sample?	Composite Sample

SOIL SAMPLE	
Sample No.	FTSW-AA90mm-2-02
Lab Analysis Required	Sb, Cu, Pb, Al, Zn Explosives/8330
Sample Collection Time	1500
Sample Collection Depth	0-6 inches
Sample Collection Device	Plastic Scoop
Grab or Composite Sample?	Composite

SAMPLE LOG REVIEW INFORMATION
REVIEWED BY: **DATE/TIME:**
NOTES:

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SOIL SAMPLING LOG

ADMINISTRATIVE DATA			
Project Number	2118093	**Date**	3-13-07
Project Name	Fort Stewert SI	**Time**	13:55
Site Location	Former Hand Grenade Course FTSW	**Sampler(s)**	Nicole Ukura
Site Contact	Algeana Stevenson	**Others Present**	Dave Smith Skelly Kolb Dan Hains
Weather Conditions (Temperature, Wind, Humidity, Sky): 74° Sunny light breeze			

SAMPLE LOCATION DESCRIPTION	
Random / Biased (describe)	Random
Depth of Sample	0-6 inches
Location Description (GPS?)	X= 436422.406 Y= 3530862.252 Z= 18.177
Grab or Composite Sample?	Composite Sample
SOIL SAMPLE	
Sample No.	FTSW-HGC-01
Lab Analysis Required	Sb, Cu, Pb, Al, Zn Explosives (8330)
Sample Collection Time	13:55
Sample Collection Depth	0-6 inches
Sample Collection Device	Plastic Scoop
Grab or Composite Sample?	Composite Sample

SAMPLE LOG REVIEW INFORMATION
REVIEWED BY: **DATE/TIME:**
NOTES:

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SOIL SAMPLING LOG

ADMINISTRATIVE DATA			
Project Number	2118-093	**Date**	3-15-07
Project Name	Fort Stewart	**Time**	1855
Site Location	Small Arms Range 3	**Sampler(s)**	David Smith
Site Contact	Algeara Stevenson	**Others Present**	Shelly Kolb, Nide Ukora, Dan Hains
Weather Conditions (Temperature, Wind, Humidity, Sky): Partly Sunny, 79°F Humid			

SAMPLE LOCATION DESCRIPTION	
Random / Biased (describe)	Random
Depth of Sample	0-6 inches
Location Description (GPS?)	X = 447418.242 Y = 3530768.299 Z = 15.924
Grab or Composite Sample?	Composite

SOIL SAMPLE	
Sample No.	FTSW-SA3-13
Lab Analysis Required	Sb, Cu, Pb
Sample Collection Time	1855
Sample Collection Depth	0-6 inches
Sample Collection Device	Plastic Scoop
Grab or Composite Sample?	Composite

SAMPLE LOG REVIEW INFORMATION
REVIEWED BY: **DATE/TIME:**
NOTES:

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SOIL SAMPLING LOG

ADMINISTRATIVE DATA			
Project Number	2118-093	Date	3-15-07
Project Name	Fort Stewart	Time	18:30
Site Location	Small Arms Range 3	Sampler(s)	David Smith
Site Contact	Alyeana Stevenson	Others Present	Shelly Kolb Nicole Ukura Dan Hains
Weather Conditions (Temperature, Wind, Humidity, Sky): Partly Sunny 78° F Humid			

SAMPLE LOCATION DESCRIPTION	
Random / Biased (describe)	Random
Depth of Sample	0-6 inches
Location Description (GPS?)	x 447248.653 y = 3530979.791 z = 13.584
Grab or Composite Sample?	Composite

SOIL SAMPLE	
Sample No.	FTSW-SA3-12 / FTSW-SA3-12D
Lab Analysis Required	Sb, Cu, Pb
Sample Collection Time	18:30
Sample Collection Depth	0-6 inches
Sample Collection Device	Plastic Scoop
Grab or Composite Sample?	Composite

SAMPLE LOG REVIEW INFORMATION
REVIEWED BY: DATE/TIME:
NOTES:

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SOIL SAMPLING LOG

ADMINISTRATIVE DATA			
Project Number	2118 093	Date	3-14-07
Project Name	Fort Stewart	Time	14:10
Site Location	Small Arms Range 1	Sampler(s)	David Smith
Site Contact	Algeana Stevenson	Others Present	Nicole Ukura Dan Hains
Weather Conditions (Temperature, Wind, Humidity, Sky): Cloudy 75° light breeze			

SAMPLE LOCATION DESCRIPTION	
Random / Biased (describe)	Random
Depth of Sample	0-6 inches
Location Description (GPS?)	X=451542.156 Y=3533856.959 Z=9.666
Grab or Composite Sample?	Composite

SOIL SAMPLE	
Sample No.	FTSW-SA1-07
Lab Analysis Required	Sb, Pb, Cu
Sample Collection Time	14:10
Sample Collection Depth	0-6 inches
Sample Collection Device	Plastic Scoop
Grab or Composite Sample?	Composite

SAMPLE LOG REVIEW INFORMATION
REVIEWED BY: DATE/TIME:
NOTES:

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SOIL SAMPLING LOG

ADMINISTRATIVE DATA			
Project Number	2118 093	Date	3-14-07
Project Name	Fort Stewart	Time	14:50
Site Location	Small Arms Range 1	Sampler(s)	David Smith
Site Contact	Algeana Stevenson	Others Present	Shelly Kolb, Nicole Ukura, Dan Hains
Weather Conditions (Temperature, Wind, Humidity, Sky):			

SAMPLE LOCATION DESCRIPTION	
Random / Biased (describe)	Biased (blank round reflective of current 10yrs of training)
Depth of Sample	0-6 inches
Location Description (GPS?)	X=451728.497 Y=3533606.168 Z=9270
Grab or Composite Sample?	Composite

SOIL SAMPLE	
Sample No.	FTSW-SA1-08
Lab Analysis Required	Sb, Cu, Pb
Sample Collection Time	14:50
Sample Collection Depth	0-6 inches
Sample Collection Device	Plastic Scoop
Grab or Composite Sample?	Composite

SAMPLE LOG REVIEW INFORMATION
REVIEWED BY: DATE/TIME:
NOTES:

MALCOLM PIRNIE

SOIL SAMPLING LOG

ADMINISTRATIVE DATA			
Project Number	2118 093	**Date**	3-14-07
Project Name	Fort Stewart	**Time**	15:45
Site Location	Small Arms Range I	**Sampler(s)**	Shelly Kolb
Site Contact	Algeana Stevenson	**Others Present**	Nicole Vkura Dan Hains
Weather Conditions (Temperature, Wind, Humidity, Sky): Partly cloudy Slight Breeze			

SAMPLE LOCATION DESCRIPTION	
Random / Biased (describe)	Biased (M143 Pop Flair)
Depth of Sample	0-6 inches
Location Description (GPS?)	x=452118.689 y= 3534293.755 z=7.837
Grab or Composite Sample?	Composite

SOIL SAMPLE	
Sample No.	FTSW-SA1-09
Lab Analysis Required	Sb, Cu, Pb
Sample Collection Time	15:45
Sample Collection Depth	0-6 inches
Sample Collection Device	Plastic Scoop
Grab or Composite Sample?	Composite

SAMPLE LOG REVIEW INFORMATION
REVIEWED BY: **DATE/TIME:**
NOTES:

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SOIL SAMPLING LOG

ADMINISTRATIVE DATA			
Project Number	2118 093	Date	3-14-07
Project Name	Fort Stewart	Time	16:05
Site Location	Small Arms Range 1	Sampler(s)	Shelly Kolb
Site Contact	Algeana Stevenson	Others Present	Nicole Vkura Dan Hairs
Weather Conditions (Temperature, Wind, Humidity, Sky): Partly Sunny 75			

SAMPLE LOCATION DESCRIPTION	
Random / Biased (describe)	Random
Depth of Sample	0-6 inches
Location Description (GPS?)	X= 452207.037 Y=3534300.086 Z=7.655
Grab or Composite Sample?	Composite
SOIL SAMPLE	
Sample No.	FTSW- SA1-16
Lab Analysis Required	Sb, Cu, Pb
Sample Collection Time	16:05
Sample Collection Depth	0-6 inches
Sample Collection Device	Plastic Scoop
Grab or Composite Sample?	Composite

SAMPLE LOG REVIEW INFORMATION
REVIEWED BY: DATE/TIME:
NOTES:

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SOIL SAMPLING LOG

ADMINISTRATIVE DATA			
Project Number	2118-093	**Date**	3-15-07
Project Name	Fort Stewart	**Time**	~~18:30~~ 1845
Site Location	Small Arms Range 3	**Sampler(s)**	David Smith
Site Contact	Algeana Stevenson	**Others Present**	Nicole Ukura Shelly Kolb Dan Hains
Weather Conditions (Temperature, Wind, Humidity, Sky): Partly Sunny 79°F Humid			

SAMPLE LOCATION DESCRIPTION	
Random / Biased (describe)	Random
Depth of Sample	0-6 inches
Location Description (GPS?)	x = 447169.866 y = 3530757.578 z = 12.517
Grab or Composite Sample?	Composite

SOIL SAMPLE	
Sample No.	FTSW-SA3-14 / FTSW-SA3-14MS / FTSW-SA3-14MSD
Lab Analysis Required	Pb Cu Sb
Sample Collection Time	~~18:30~~ 1845
Sample Collection Depth	0-6 inches
Sample Collection Device	Plastic Scoop
Grab or Composite Sample?	Composite

SAMPLE LOG REVIEW INFORMATION
REVIEWED BY: **DATE/TIME:**
NOTES:

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SOIL SAMPLING LOG

ADMINISTRATIVE DATA			
Project Number	2118 093	**Date**	3-15-07
Project Name	Fort Stewart	**Time**	12:05
Site Location	Hero Road Trench	**Sampler(s)**	David Smith
Site Contact	Alexana Stevenson	**Others Present**	Dan Hains
Weather Conditions (Temperature, Wind, Humidity, Sky): Partly Sunny 70°F light breeze			

SAMPLE LOCATION DESCRIPTION	
Random / Biased (describe)	Biased (near suspected trench)
Depth of Sample	0-6 inches
Location Description (GPS?)	X = 442312.266 Y = 3527197.396 Z = 31.414
Grab or Composite Sample?	Composite

SOIL SAMPLE	
Sample No.	FTSW-HRT-10
Lab Analysis Required	Sb, Cu, Al, Pb, Zn, Explosives 8330
Sample Collection Time	12:05
Sample Collection Depth	0-6 inches
Sample Collection Device	Plastic Scoop
Grab or Composite Sample?	Composite

SAMPLE LOG REVIEW INFORMATION
REVIEWED BY: **DATE/TIME:**
NOTES:

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Surface ~~GROUND~~WATER SAMPLING LOG

ADMINISTRATIVE DATA			
Project Number	218 093	Date	3-14-07
Project Name	Fort Stewart	Time	17:25
Site Location	Small Arms Range 3	Sampler(s)	~~Stet~~ David Smith
Site Contact	Algeana Stevenson	Others Present	Shelly Kolb Nicole Ukura

Weather Conditions (Temperature, Wind, Humidity, Sky):
Partly Cloudy 75° Breezy

INSTRUMENTATION DATA		
Water Quality Meters		
Water Quality Readings	pH	5.70
	Temperature	22.5
	Turbidity (NTUs)	4
	DO (mg/l)	5.78
	Spec. Cond. (umhos/cm)	.088

Sample No./Well Number	FTSW-SA3-SW02-M / MSD & FTSW-SA3-SW02 FTSW-SA3-SED02
Lab Analysis Required	Sb Cu Pb
Sample Collection Time	17:25
Sample Collection Device	Plastic Bottle
Grab or Composite Sample?	Grab

SAMPLE LOG REVIEW INFORMATION
REVIEWED BY: DATE/TIME:
NOTES:

MALCOLM PIRNIE

~~GROUND~~ Surface WATER SAMPLING LOG

ADMINISTRATIVE DATA			
Project Number	2118093	**Date**	3-14-07
Project Name	Fort Stewart	**Time**	1715
Site Location	Small Arms Range 3	**Sampler(s)**	David Smith
Site Contact	Algeana Stevenson	**Others Present**	Shelly Kolb, Nicole Ukura Dan Hains
Weather Conditions (Temperature, Wind, Humidity, Sky): partly cloudy, 75°, breezy			

INSTRUMENTATION DATA		
Water Quality Meters		
Water Quality Readings	**pH**	5.15
	Temperature	22.9°C
	Turbidity (NTUs)	3
	DO (mg/l)	5.35
	Spec. Cond. (umhos/cm)	.087 mS/cm

Sample No./Well Number	FTSW-SA3-SW01 / FTSW-SA3-SED01
Lab Analysis Required	Sb, Cu, Pb
Sample Collection Time	1715
Sample Collection Device	Plastic Bottle
Grab or Composite Sample?	Grab

SAMPLE LOG REVIEW INFORMATION

REVIEWED BY:
DATE/TIME:

NOTES:

Appendix C: Analytical Data and Chemical Data Quality Assessment

Chemical Data Quality Assessment

For the

CONFIRMATORY SAMPLING REPORT

OF

FORT STEWART

FOR

BALTIMORE DISTRICT – U.S. ARMY CORPS OF ENGINEERS
BALTIMORE, MARYLAND

CONTRACT NO. W912DR-05-D-0004

MALCOLM PIRNIE, INC.
300 EAST LOMBARD STREET, SUITE 610
BALTIMORE, MARYLAND

June 2007

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1.0 Project Scope

This Quality Control Summary Report presents the data verification for samples collected on March 13, 14, and 15, 2007 at the Fort Stewart FTSW in Hinesville, Georgia. Data verification was performed in accordance with the procedures specified in the Quality Assurance Project Plan (QAPP) for Military Munitions Response Program (MMRP) Site Inspections (SIs) (Malcolm Pirnie Inc., June 2006), United States Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (USEPA, 2004), USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (USEPA, 1999), and quality control (QC) parameters set forth by the project laboratory, Analytical Laboratory Services, Inc. (ALSI).

2.0 Project Description

A total of twenty-one surface soil, sediment, and surface water samples were collected from Fort Stewart and were submitted to ALSI for the following analyses:

- Explosives by USEPA Method 8330
- Metals by USEPA Methods 6010B and 6020
- Wet Chemistry (Percent Moisture and Total Solids) by Standard Method (SM)20-2540G

Three QC samples (field duplicate) were submitted to ALSI. A complete list of samples with their respective analyses is presented in Table 1.

3.0 Quality Control Activities

Sample results were subject to an examination of precision, accuracy, and completeness, in accordance with the specifications listed in the QAPP for MMRP SIs. An evaluation of the following QC parameters was conducted:

- Sample Preservation and Temperature Upon Laboratory Receipt
- Holding Times
- Method Blank Contamination
- Surrogate Recovery (for explosives analyses)
- Laboratory Control Sample (LCS) Recovery
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recovery and Relative Percent Difference (RPD)
- Field Duplicates

Results that required qualification based on the data verification are presented in Table 2 and are described in the following sections.

3.1 Laboratory Quality Control

3.1.1 Data Qualifier Flags

Data qualifier flags are used by the laboratory and during data verification to notify the user of any possible uncertainty. Definitions of the most widely used data qualifiers in this assessment are:

J The analyte was positively identified; however, the result should be considered an estimated value.

UJ The analyte was not detected above the reporting limit; however, the reporting limit is considered an estimated value.

R Quality control parameters indicate that data is not usable.

Results qualified as "J" or UJ" are of acceptable data quality and may be used quantitatively to fulfill the objectives of the analytical program, per EPA guidelines.

3.1.2 Sample Preservation and Temperature upon Laboratory Receipt

Samples were received by ALSI at the correct temperature (4 ± 2 degrees Celsius); therefore, data qualification was not required.

3.1.3 Holding Times

Samples were extracted and analyzed within the holding time limits set by the respective USEPA and standard methods.

3.1.4 Method Blanks

Method blanks were performed at the required frequencies. Method blanks were evaluated based on the following criteria:

Blank contamination was evaluated by the following criteria.

- If the concentration in the associated samples is less than 10 times the concentration in the blank, the sample should be qualified with a U.
- If the concentration in the associated samples is greater than 10 times the concentration in the blank, the sample should not be qualified.

Target compounds were not detected in the blanks with the following exceptions:

- Copper was detected in two method blanks at concentrations of 0.002 and 0.6

mg/L. Copper results for all samples in the associated batches were qualified with a U.

- Antimony was detected in two method blanks at concentrations of 0.0063 and 0.023 mg/L. Antimony results for all samples in the associated batches were qualified with a U.
- Lead was detected in three method blanks at concentrations of 0.017, 0.024, and 0.0077 mg/L. No qualification was required because the concentrations in the samples were greater than ten times the concentrations in the blanks.

3.1.5 Surrogate Recovery

Surrogate compounds are analyzed in order to evaluate the extent of matrix effects on the samples such as interferences or high concentrations. Surrogate recoveries were within control limits.

3.1.6 Laboratory Control Samples

Laboratory control samples are generated in order to evaluate the accuracy of the analytical method. LCSs were performed at the required frequency and recoveries were within acceptable control limits. LCS/LCS duplicates were evaluated based on the following criteria:

- If the analyte recovery was above acceptance limits for LCS or LCS duplicate but the analyte was not detected in the associated batch, then data qualification was not required.
- If the analyte recovery was above acceptance limits for LCS or LCS duplicate and the analyte was detected in the associated batch, then the analyte results were qualified "J".
- If the analyte recovery was below acceptance limits for LCS or LCS duplicate then the analyte results in the associated analytical batch were qualified ("UJ" for non-detects and "J" for detected results).
- If the analyte recovery was less than 10 percent, the analyte results in the associated analytical batch were rejected and qualified "R".

3.1.7 Matrix Spike/Matrix Spike Duplicate Recovery and Relative Percent Difference

Matrix spike and matrix spike duplicates were performed at the required frequency. MS/MSD samples were evaluated by the following criteria:

- If MS or MSD recovery for an analyte is above acceptance limits but the analyte is not detected in the associated samples, then data qualification was not required.
- If MS or MSD recovery for an analyte is above acceptance limits and the analyte is detected in the associated samples, the analyte results were qualified "J".
- Low MS/MSD recoveries for inorganic parameters result in sample qualification of the associated analytical batch.
- Low MS/MSD recoveries for organic parameters result in the data qualification of the unspiked sample rather than the analytical batch.
- Results were not qualified based on non-project specific MS/MSD (i.e., batch QC) recoveries.

MS/MSD percent recoveries and RPDs were within acceptance limits except for the following:

- The MS/MSD for sample FTSW-AA04 had recoveries outside of acceptance limits and exceeded the RPD limit for antimony and lead. Data qualification was required for this sample to indicate a potential bias.

- The MS/MSD for sample FTSW-SA3-SD02 for antimony did not meet the recovery limits. Data qualification was required for this sample to indicate a potential bias.

- The MS/MSD for sample FTSW-SA3-14 had recoveries outside of acceptance limits and exceeded the RPD limit for antimony. Data qualification was required for this sample to indicate a potential bias.

3.1.8 Field Duplicates

Three field duplicate samples were collected and submitted for analyses. The RPDs between the field sample and its associated sample were calculated and are presented in Table 3. The field duplicate evaluation criteria are as follows:

- If an analyte is detected at a concentration greater than five times the method reporting limit, the RPD should be less than 30 percent.

- If an analyte is detected in the sample and field duplicate, but is less than five times the method reporting limit, the difference between the sample and the field duplicate should not exceed the method reporting limit.

Field duplicate RPDs were within acceptance limits.

4.0 Evaluation of Quality Control Parameters

The data quality for the sampling at the FTSW site has been measured and evaluated in terms of specific indicators:

- Precision
- Bias
- Representativeness
- Comparability
- Completeness
- Sensitivity

Many of these indicators are evaluated in a quantitative manner and acceptance limits are described in the sections below. Two of these parameters are more qualitative in nature (i.e., representativeness and comparability). The following sections describe the data quality indicators and the quality level of this data.

4.1 Precision

Precision is a measure of the reproducibility of analyses under a given set of conditions. Sampling precision is demonstrated through collection and analysis of field duplicates. MS/MSD data can be used to evaluate both sampling and/or analytical precision depending on their preparation. Precision is measured by calculating the RPD. MS/MSD outliers resulted in the qualification of antimony results in three samples and lead results in one samples and their associated field duplicates. Other sample results did not required qualification based on MS/MSD or field duplicate RPDs thus indicating good sampling precision.

4.2 Bias

Bias refers to the systematic or persistent distortion of a measurement process that causes errors in one direction (above or below the true value or mean). Accuracy is a measure of closeness between an observed value and the 'true' value, but it does not differentiate between random error and systematic error (i.e. bias). Bias is impacted by errors introduced through the sampling process, handling, analytical procedures, and the sample matrix. Bias is evaluated through the collection and analysis of MS/MSD, LCS, and surrogate compounds. There were cases of MS/MSD percent recoveries outside of the established control limits for two metals resulted in qualification. Overall, there is little bias in the data with the exception of several metals.

4.3 Representativeness

Representativeness is a qualitative parameter that evaluates the degree to which sample data accurately and precisely represent a characteristic of a population, a sampling point, or an environmental condition. Sample handling protocols (e.g., collection, storage, preservation, and transportation) have been established to ensure samples are representative of field conditions. The overall representativeness of the data is good as indicated by the sample handling protocols and satisfactory holding times.

4.4 Comparability

Comparability is a qualitative parameter that expresses the confidence with which one data set may be compared to another. This is a concern when current data are being integrated with historical data. Comparability of data is maximized through the use of standard operating procedures in the field and the laboratory, standardized analytical methods, and consistent units of measure. The overall comparability of the data is good as indicated by the use of standardized analytical and sampling procedures.

4.5 Completeness

Completeness is a measure of the amount of valid data obtained compared to the total number of measurements planned. Completeness shall be evaluated qualitatively and quantitatively. The qualitative evaluation of completeness shall be determined as a function of the events contributing to the sampling event. This includes items such as samples arriving at the laboratory intact, properly preserved, and in sufficient quantity to perform the requested analyses all of which were achieved.

The quantitative description of completeness shall be defined as the percentage of QC parameters that are acceptable. Contractual completeness is defined as the number of samples that have not been qualified for QC reasons divided by the number of requested sample results multiplied by 100. Technical completeness is defined as the total number of usable results divided by the number of requested sample results multiplied by 100. The completeness goal for sample holding times is 100 percent; for all other QC parameters, the goal is 90 percent. Table 4-1 summarizes the contractual and technical compliance for this sampling event.

Project data was within technical compliance control limits for all analytes. The contractual compliance for two metals was less than 90 percent due to blank contamination and MS/MSD recoveries and RPD that were outside of acceptance limits.

4.6 Sensitivity

Sensitivity describes the relationship between the reporting limits and the project quality goals. This is important for project objectives eliminating the chance of an analyte being reported as “not detected” at a concentration that is greater than a regulatory guidance value. The reporting limits for all but one of the analytes in the soil samples were below the ARBCA Residential Soil Screening Levels. The reporting limit for thallium was below the ARBCA Residential SSL, and this is noted in the Summary and Conclusions section of the SI Report.

5.0 Conclusion

Three metals required data qualification based on MS/MSD recoveries that were outside of acceptance limits and method blank contamination. Overall, the sample analyses were completed with quality assurance and control protocols met. This data set is considered usable and meets project data quality objectives.

Table 1
Quality Control Summary Report
Fort Stewart

Sample ID	Lab ID	Collected	Sample Type	Parameters
FTSW-HGC-01	9678547-01	3/13/2007	N	Explosives, Sb, Cu, Pb, Al, Zn, Wet Chemistry
FTSW-AA90MM2-02	9678547-02	3/13/2007	N	Explosives, Sb, Cu, Pb, Al, Zn, Wet Chemistry
FTSW-AA1-03	9678547-03	3/13/2007	N	Explosives, Sb, Cu, Pb, Al, Zn, Wet Chemistry
FTSW-AA-03D	9678547-04	3/13/2007	FD of FTSW-AA1-03	Explosives, Sb, Cu, Pb, Al, Zn, Wet Chemistry
FTSW-AA-04	9678547-05	3/13/2007	N	Explosives, Sb, Cu, Pb, Al, Zn, Wet Chemistry
FTSW-AA1-05	9678547-06	3/13/2007	N	Explosives, Sb, Cu, Pb, Al, Zn, Wet Chemistry
FTSW-AA1-06	9678547-07	3/13/2007	N	Explosives, Sb, Cu, Pb, Al, Zn, Wet Chemistry
FTSW-SA1-07	9678547-08	3/14/2007	N	Sb, Cu, Pb, Wet Chemistry
FTSW-SA1-08	9678547-09	3/14/2007	N	Sb, Cu, Pb, Wet Chemistry
FTSW-SA1-09	9678547-10	3/14/2007	N	Sb, Cu, Pb, Wet Chemistry
FTSW-SA1-10	9678547-11	3/14/2007	N	Sb, Cu, Pb, Wet Chemistry
FTSW-SA3-SW01	9678547-12	3/14/2007	N	Sb, Cu, Pb, Wet Chemistry
FTSW-SA3-SW02	9678547-13	3/14/2007	N	Sb, Cu, Pb, Wet Chemistry
FTSW-HRT-11	9678547-14	3/15/2007	N	Explosives, Sb, Cu, Pb, Al, Zn, Wet Chemistry
FTSW-SA3-13	9678547-15	3/15/2007	N	Sb, Cu, Pb, Wet Chemistry
FTSW-SA3-14	9678547-16	3/15/2007	N	Sb, Cu, Pb, Wet Chemistry
FTSW-SA3-12	9678547-17	3/15/2007	N	Sb, Cu, Pb, Wet Chemistry
FTSW-SA3-12D	9678547-18	3/15/2007	FD of FTSW-SA3-12	Sb, Cu, Pb, Wet Chemistry
FTSW-SA3-SD02	9678547-19	3/14/2007	N	Sb, Cu, Pb, Wet Chemistry
FTSW-SA3-SD01	9678547-20	3/14/2007	N	Sb, Cu, Pb, Wet Chemistry
FTSW-SA3-SD01-D	9678547-21	3/14/2007	FD of FTSW-SA3-SD01	Sb, Cu, Pb, Wet Chemistry

Table 2
Quality Control Summary Report
Fort Stewart

Sample ID	Analyte	Result	Units	Qualified Results	Comments
FTSW-HGC-01	Antimony	0.011J	mg/L	0.011UJ	Qualified due to method blank contamination
FTSW-AA90MM2-02	Antimony	0.007J	mg/L	0.007UJ	Qualified due to method blank contamination
FTSW-AA1-03	Antimony	0.055J	mg/L	0.055UJ	Qualified due to method blank contamination
FTSW-AA-03D	Antimony	0.03J	mg/L	0.03UJ	Qualified due to method blank contamination
FTSW-AA-04	Antimony	0.2	mg/L	0.2U	Qualified due to method blank contamination
FTSW-AA1-05	Antimony	0.074J	mg/L	0.074UJ	Qualified due to method blank contamination
FTSW-AA1-06	Antimony	0.016J	mg/L	0.016UJ	Qualified due to method blank contamination
FTSW-SA1-07	Antimony	0.056J	mg/L	0.056UJ	Qualified due to method blank contamination
FTSW-SA1-08	Antimony	0.010J	mg/L	0.010UJ	Qualified due to method blank contamination
FTSW-SA1-09	Antimony	0.019J	mg/L	0.019UJ	Qualified due to method blank contamination
FTSW-SA1-10	Antimony	0.017J	mg/L	0.017UJ	Qualified due to method blank contamination
FTSW-HRT-11	Antimony	0.83	mg/L	0.83U	Qualified due to method blank contamination
FTSW-SA3-13	Antimony	0.026J	mg/L	0.026UJ	Qualified due to method blank contamination
FTSW-SA3-12	Antimony	0.072J	mg/L	0.072UJ	Qualified due to method blank contamination
FTSW-SA3-12D	Antimony	0.039J	mg/L	0.039UJ	Qualified due to method blank contamination
FTSW-SA3-SD01	Antimony	0.017J	mg/L	0.017UJ	Qualified due to method blank contamination
FTSW-SA3-SW01	Copper	0.005J	mg/L	0.005UJ	Qualified due to method blank contamination
FTSW-SA3-SW02	Copper	0.005J	mg/L	0.005UJ	Qualified due to method blank contamination
FTSW-SA1-09	Copper	0.8J	mg/L	0.8UJ	Qualified due to method blank contamination
FTSW-SA1-10	Copper	1J	mg/L	1UJ	Qualified due to method blank contamination
FTSW-HRT-11	Copper	1J	mg/L	1UJ	Qualified due to method blank contamination
FTSW-SA3-13	Copper	1J	mg/L	1UJ	Qualified due to method blank contamination
FTSW-SA3-14	Copper	0.8J	mg/L	0.8UJ	Qualified due to method blank contamination
FTSW-SA3-12	Copper	1J	mg/L	1UJ	Qualified due to method blank contamination
FTSW-SA3-12D	Copper	1J	mg/L	1UJ	Qualified due to method blank contamination
FTSW-SA3-SD02	Copper	2J	mg/L	2UJ	Qualified due to method blank contamination
FTSW-SA3-SD01	Copper	0.4J	mg/L	0.4UJ	Qualified due to method blank contamination
FTSW-SA3-SD01-D	Copper	0.4J	mg/L	0.4UJ	Qualified due to method blank contamination
FTSW-SA3-14	Antimony	0.017J	mg/L	0.017UJ	Qualified due to method blank contamination
FTSW-AA04	Antimony	0.2	mg/L	0.2J	Qualified due to MS/MSD does not meet recovery limits, and RPD exceeds limit
FTSW-AA04	Lead	13.8	mg/L	13.8J	MS/MSD and RPD exceeds recovery limits
FTSW-SA3-SD02	Antimony	0.017J	mg/L	0.017J	MS/MSD does not meet recovery limits
FTSW-SA3-14	Antimony	0.017J	mg/L	0.017J	MS/MSD and RPD exceeds recovery limits

Notes:
mg/L - milligram per liter
J = estimated value
RPD = Relative Percent Difference

Table 3
Field Duplicate Summary
Fort Stewart

Sample ID / Field Duplicate ID	Parameters	Sample Result	Field Duplicate Result	RPD (%)
FTSW-AA1-03/FTSW-AA1-03D	Explosives			
	All analytes	ND	ND	NC
	Metals			
	Aluminum	3100	3010	2.9
	Antimony	0.055J	0.030J	NC
	Copper	1J	1J	NC
	Lead	65.3	67.7	3.6
	Zinc	5	5	0.0
	Water Chemistry			
	Moisture	19.8	20.9	5.4
	Total Solids	80.2	79.1	1.4
FTSW-SA3-12/ FTSW-SA3-12D	Metals			
	Antimony	0.072J	0.039J	NC
	Copper	1J	1J	NC
	Lead	6.7	6.6	1.5
	Water Chemistry			
	Moisture	27.9	28.1	0.7
	Total Solids	72.1	71.9	0.3
FTSW-SA3-SD01/ FTSW-SA3-SD01-D	Metals			
	Antimony	0.084J	0.032J	NC
	Copper	0.4J	0.4J	NC
	Lead	1.4	1.1	24.0
	Water Chemistry			
	Moisture	16.7	16.1	3.7
	Total Solids	83.3	83.9	0.7

Notes:
RPD = Relative percent difference; [(difference)/(average*1/2)]*100
ND = No analytes detected
NC = Not calculated
* = Field duplicate outlier

Table 4
Completeness Summary
Fort Stewart

Parameters	Total Number of Samples	Number in Contractual Compliance	Percent Contractual Compliance	Number of Usable Results	Percent Technical Compliance
Explosives					
All Analytes	8	8	100	8	100
Metals					
Aluminum	8	8	100	8	100
Antimony	21	3[a,b,c]	14	21	100
Copper	21	9[a]	43	21	100
Lead	21	20[b,d]	95	21	100
Zinc	8	8	100	8	100
Water Chemistry					
Moisture	21	21	100	21	100
Total Solids	21	21	100	21	100

Notes:
Number of samples used in completeness calculationsincludes field samples and field duplicates
Percent Contractual Compliance = (Number of contract compliant results/Number of reported results) * 100
Percent Technical Compliance = (Number of usable results/Number of reported results) * 100
[a] = Qualified due to method blank contamination
[b] = Qualified due to high RPD
[c] = Qualified due to MS/MSD not meeting recovery limits
[d] = Qualified due to MS/MSD exceeding recovery limits

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Certificate of Analysis

Project Name:	**FT STEWART -GA - REV 022607**	Workorder:	**9678547**
Purchase Order:		Workorder ID:	**FT STEWART -GA - REV 022607**

Mr. David Smith
Malcolm Pirnie-MD
300 East Lombard Street
Suite 610
Baltimore, MD 21202

April 12, 2007

Dear Mr. Smith,

Enclosed are the analytical results for samples received by the laboratory on Saturday, March 17, 2007

ALSI is a National Environmental Laboratory Accreditation Conference (NELAC) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAC.

If you have any questions regarding this certificate of analysis, please contact Tonya Hironimus (Project Coordinator) or Raymond Martrano (Laboratory Manager) at (717) 944-5541.

Please visit us at www.analyticallab.com for a listing of ALSI's NELAC accreditations and Scope of Work, as well as other links to Water Quality documentation on the internet.

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Analytical Laboratory Services, Inc.

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Raymond J. Martrano
Laboratory Manager

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SAMPLE SUMMARY

Workorder: 9678547 FT STEWART -GA - REV 022607

Discard Date: 06/11/2007

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
9678547001	FTSW-HGC-01	Solid	3/13/07 13:55	3/17/07 09:00	Customer
9678547002	FTSW-AA90MM2-02	Solid	3/13/07 15:00	3/17/07 09:00	Customer
9678547003	FTSW-AA1-03	Solid	3/13/07 16:05	3/17/07 09:00	Customer
9678547004	FTSW-AA-03D	Solid	3/13/07 16:05	3/17/07 09:00	Customer
9678547005	FTSW-AA-04	Solid	3/13/07 16:20	3/17/07 09:00	Customer
9678547006	FTSW-AA1-05	Solid	3/13/07 16:45	3/17/07 09:00	Customer
9678547007	FTSW-AA1-06	Solid	3/13/07 17:00	3/17/07 09:00	Customer
9678547008	FTSW-SA1-07	Solid	3/14/07 14:10	3/17/07 09:00	Customer
9678547009	FTSW-SA1-08	Solid	3/14/07 14:50	3/17/07 09:00	Customer
9678547010	FTSW-SA1-09	Solid	3/14/07 15:45	3/17/07 09:00	Customer
9678547011	FTSW-SA1-10	Solid	3/14/07 16:05	3/17/07 09:00	Customer
9678547012	FTSW-SA3-SW01	Water	3/14/07 17:15	3/17/07 09:00	Customer
9678547013	FTSW-SA3-SW02	Water	3/14/07 17:25	3/17/07 09:00	Customer
9678547014	FTSW-HRT-11	Solid	3/15/07 12:05	3/17/07 09:00	Customer
9678547015	FTSW-SA3-13	Solid	3/15/07 18:45	3/17/07 09:00	Customer
9678547016	FTSW-SA3-14	Solid	3/15/07 18:55	3/17/07 09:00	Customer
9678547017	FTSW-SA3-12	Solid	3/15/07 18:30	3/17/07 09:00	Customer
9678547018	FTSW-SA3-12D	Solid	3/15/07 18:30	3/17/07 09:00	Customer
9678547019	FTSW-SA3-SD02	Solid	3/14/07 17:45	3/17/07 09:00	Customer
9678547020	FTSW-SA3-SD01	Solid	3/14/07 18:00	3/17/07 09:00	Customer
9678547021	FTSW-SA3-SD01-D	Solid	3/14/07 18:00	3/17/07 09:00	Customer

Workorder Comments:

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SAMPLE SUMMARY

Workorder: 9678547 FT STEWART -GA - REV 022607 | Discard Date: 06/11/2007

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By

Notes

- -- Samples collected by ALSI personnel are done so in accordance with the procedures set forth in the ALSI Field Sampling Plan (20 - Field Services Sampling Plan).
- -- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
- -- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
- -- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
- -- The Chain of Custody document is included as part of this report.

Standard Acronyms/Flags

J, B	Both flags indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
U	Indicates that the analyte was Not Detected (ND)
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
RDL	Reporting Detection Limit
ND	Not Detected - indicates that the analyte was Not Detected at the RDL
Cntr	Analysis was performed using this container
RegLmt	Regulatory Limit
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
%Rec	Percent Recovery
RPD	Relative Percent Difference

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ANALYTICAL RESULTS

Workorder: 9678547 FT STEWART -GA - REV 022607

Lab ID:	**9678547001**	Date Collected:	3/13/2007 13:55	Matrix:	Solid
Sample ID:	**FTSW-HGC-01**	Date Received:	3/17/2007 09:00		

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr	RegLmt
EXPLOSIVES											
2-Amino-4,6-Dinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 15:33	ELC	A	
4-Amino-2,6-dinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 15:33	ELC	A	
1,3-Dinitrobenzene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 15:33	ELC	A	
2,4-Dinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 15:33	ELC	A	
2,6-Dinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 15:33	ELC	A	
HMX	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 15:33	ELC	A	
Nitrobenzene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 15:33	ELC	A	
4-Nitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 15:33	ELC	A	
2-Nitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 15:33	ELC	A	
3-Nitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 15:33	ELC	A	
RDX	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 15:33	ELC	A	
Tetryl	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 15:33	ELC	A	
1,3,5-Trinitrobenzene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 15:33	ELC	A	
2,4,6-Trinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 15:33	ELC	A	
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*	*RegLmt*
3-Nitrochlorobenzene (S)	97		%	50-150	SW846 8330A	3/24/07	ELC	3/27/07 15:33	ELC	A	
WET CHEMISTRY											
Moisture	18.6		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
Total Solids	81.4		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
METALS											
Aluminum, Total	15500		mg/kg	10	SW846 6010B	3/22/07	CMD	3/23/07 07:45	TED	A1	
Antimony, Total	0.011J		mg/kg	0.15	SW846 6020	3/23/07	CMD	3/29/07 16:52	AJB	A2	
Copper, Total	16		mg/kg	2	SW846 6010B	3/22/07	CMD	3/23/07 07:45	TED	A1	
Lead, Total	12.5		mg/kg	0.15	SW846 6020	3/23/07	CMD	3/29/07 16:52	AJB	A2	
Zinc, Total	175		mg/kg	2	SW846 6010B	3/22/07	CMD	3/23/07 07:45	TED	A1	

Sample Comments:

Raymond J. Martrano
Laboratory Manager

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ANALYTICAL RESULTS

Workorder: 9678547 FT STEWART -GA - REV 022607

Lab ID: **9678547002** Date Collected: 3/13/2007 15:00 Matrix: Solid
Sample ID: **FTSW-AA90MM2-02** Date Received: 3/17/2007 09:00

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr	RegLmt
EXPLOSIVES											
2-Amino-4,6-Dinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 16:19	ELC	A	
4-Amino-2,6-dinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 16:19	ELC	A	
1,3-Dinitrobenzene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 16:19	ELC	A	
2,4-Dinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 16:19	ELC	A	
2,6-Dinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 16:19	ELC	A	
HMX	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 16:19	ELC	A	
Nitrobenzene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 16:19	ELC	A	
4-Nitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 16:19	ELC	A	
2-Nitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 16:19	ELC	A	
3-Nitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 16:19	ELC	A	
RDX	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 16:19	ELC	A	
Tetryl	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 16:19	ELC	A	
1,3,5-Trinitrobenzene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 16:19	ELC	A	
2,4,6-Trinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 16:19	ELC	A	
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*	*RegLmt*
3-Nitrochlorobenzene (S)	98		%	50-150	SW846 8330A	3/24/07	ELC	3/27/07 16:19	ELC	A	
WET CHEMISTRY											
Moisture	39.1		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
Total Solids	60.9		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
METALS											
Aluminum, Total	3960		mg/kg	13	SW846 6010B	3/22/07	CMD	3/23/07 07:51	TED	A1	
Antimony, Total	0.0070J		mg/kg	0.20	SW846 6020	3/23/07	CMD	3/29/07 16:55	AJB	A2	
Copper, Total	1J		mg/kg	3	SW846 6010B	3/22/07	CMD	3/23/07 07:51	TED	A1	
Lead, Total	6.5		mg/kg	0.20	SW846 6020	3/23/07	CMD	3/29/07 16:55	AJB	A2	
Zinc, Total	25		mg/kg	3	SW846 6010B	3/22/07	CMD	3/23/07 07:51	TED	A1	

Sample Comments:

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Laboratory Manager

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ANALYTICAL RESULTS

Workorder: 9678547 FT STEWART -GA - REV 022607

Lab ID: **9678547003** Date Collected: 3/13/2007 16:05 Matrix: Solid
Sample ID: **FTSW-AA1-03** Date Received: 3/17/2007 09:00

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr	RegLmt
EXPLOSIVES											
2-Amino-4,6-Dinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 17:05	ELC	A	
4-Amino-2,6-dinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 17:05	ELC	A	
1,3-Dinitrobenzene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 17:05	ELC	A	
2,4-Dinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 17:05	ELC	A	
2,6-Dinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 17:05	ELC	A	
HMX	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 17:05	ELC	A	
Nitrobenzene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 17:05	ELC	A	
4-Nitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 17:05	ELC	A	
2-Nitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 17:05	ELC	A	
3-Nitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 17:05	ELC	A	
RDX	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 17:05	ELC	A	
Tetryl	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 17:05	ELC	A	
1,3,5-Trinitrobenzene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 17:05	ELC	A	
2,4,6-Trinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 17:05	ELC	A	
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*	*RegLmt*
3-Nitrochlorobenzene (S)	99		%	50-150	SW846 8330A	3/24/07	ELC	3/27/07 17:05	ELC	A	
WET CHEMISTRY											
Moisture	19.8		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
Total Solids	80.2		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
METALS											
Aluminum, Total	3100		mg/kg	11	SW846 6010B	3/22/07	CMD	3/23/07 07:57	TED	A1	
Antimony, Total	0.055J		mg/kg	0.19	SW846 6020	3/23/07	CMD	3/29/07 16:58	AJB	A2	
Copper, Total	1J		mg/kg	2	SW846 6010B	3/22/07	CMD	3/23/07 07:57	TED	A1	
Lead, Total	65.3		mg/kg	0.19	SW846 6020	3/23/07	CMD	3/29/07 16:58	AJB	A2	
Zinc, Total	5		mg/kg	2	SW846 6010B	3/22/07	CMD	3/23/07 07:57	TED	A1	

Sample Comments:

Raymond J. Martrano
Laboratory Manager

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ANALYTICAL RESULTS

Workorder: 9678547 FT STEWART -GA - REV 022607

Lab ID:	**9678547004**	Date Collected:	3/13/2007 16:05	Matrix:	Solid
Sample ID:	**FTSW-AA-03D**	Date Received:	3/17/2007 09:00		

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr	RegLmt
EXPLOSIVES											
2-Amino-4,6-Dinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 17:51	ELC	A	
4-Amino-2,6-dinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 17:51	ELC	A	
1,3-Dinitrobenzene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 17:51	ELC	A	
2,4-Dinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 17:51	ELC	A	
2,6-Dinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 17:51	ELC	A	
HMX	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 17:51	ELC	A	
Nitrobenzene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 17:51	ELC	A	
4-Nitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 17:51	ELC	A	
2-Nitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 17:51	ELC	A	
3-Nitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 17:51	ELC	A	
RDX	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 17:51	ELC	A	
Tetryl	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 17:51	ELC	A	
1,3,5-Trinitrobenzene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 17:51	ELC	A	
2,4,6-Trinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 17:51	ELC	A	
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*	*RegLmt*
3-Nitrochlorobenzene (S)	102		%	50-150	SW846 8330A	3/24/07	ELC	3/27/07 17:51	ELC	A	
WET CHEMISTRY											
Moisture	20.9		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
Total Solids	79.1		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
METALS											
Aluminum, Total	3010		mg/kg	8	SW846 6010B	3/22/07	CMD	3/23/07 08:13	TED	A1	
Antimony, Total	0.030J		mg/kg	0.23	SW846 6020	3/23/07	CMD	3/29/07 17:00	AJB	A2	
Copper, Total	1J		mg/kg	2	SW846 6010B	3/22/07	CMD	3/23/07 08:13	TED	A1	
Lead, Total	67.7		mg/kg	0.23	SW846 6020	3/23/07	CMD	3/29/07 17:00	AJB	A2	
Zinc, Total	5		mg/kg	2	SW846 6010B	3/22/07	CMD	3/23/07 08:13	TED	A1	

Sample Comments:

Raymond J. Martrano
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ANALYTICAL RESULTS

Workorder: 9678547 FT STEWART -GA - REV 022607

Lab ID: **9678547005** Date Collected: 3/13/2007 16:20 Matrix: Solid

Sample ID: **FTSW-AA-04** Date Received: 3/17/2007 09:00

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr	RegLmt
EXPLOSIVES											
2-Amino-4,6-Dinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 18:37	ELC	A	
4-Amino-2,6-dinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 18:37	ELC	A	
1,3-Dinitrobenzene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 18:37	ELC	A	
2,4-Dinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 18:37	ELC	A	
2,6-Dinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 18:37	ELC	A	
HMX	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 18:37	ELC	A	
Nitrobenzene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 18:37	ELC	A	
4-Nitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 18:37	ELC	A	
2-Nitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 18:37	ELC	A	
3-Nitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 18:37	ELC	A	
RDX	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 18:37	ELC	A	
Tetryl	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 18:37	ELC	A	
1,3,5-Trinitrobenzene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 18:37	ELC	A	
2,4,6-Trinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 18:37	ELC	A	
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*	*RegLmt*
3-Nitrochlorobenzene (S)	100		%	50-150	SW846 8330A	3/24/07	ELC	3/27/07 18:37	ELC	A	
WET CHEMISTRY											
Moisture	3.5		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
Total Solids	96.5		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
METALS											
Aluminum, Total	2700		mg/kg	8	SW846 6010B	3/22/07	CMD	3/23/07 08:19	TED	A1	
Antimony, Total	0.20	1	mg/kg	0.12	SW846 6020	3/23/07	CMD	3/29/07 17:03	AJB	A2	
Copper, Total	2J		mg/kg	2	SW846 6010B	3/22/07	CMD	3/23/07 08:19	TED	A1	
Lead, Total	19.8	1,2	mg/kg	0.12	SW846 6020	3/23/07	CMD	3/29/07 17:03	AJB	A2	
Zinc, Total	12		mg/kg	2	SW846 6010B	3/22/07	CMD	3/23/07 08:19	TED	A1	

Sample Comments:

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ANALYTICAL RESULTS

Workorder: 9678547 FT STEWART -GA - REV 022607

Lab ID: **9678547006** Date Collected: 3/13/2007 16:45 Matrix: Solid
Sample ID: **FTSW-AA1-05** Date Received: 3/17/2007 09:00

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr	RegLmt
EXPLOSIVES											
2-Amino-4,6-Dinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 20:55	ELC	A	
4-Amino-2,6-dinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 20:55	ELC	A	
1,3-Dinitrobenzene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 20:55	ELC	A	
2,4-Dinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 20:55	ELC	A	
2,6-Dinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 20:55	ELC	A	
HMX	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 20:55	ELC	A	
Nitrobenzene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 20:55	ELC	A	
4-Nitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 20:55	ELC	A	
2-Nitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 20:55	ELC	A	
3-Nitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 20:55	ELC	A	
RDX	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 20:55	ELC	A	
Tetryl	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 20:55	ELC	A	
1,3,5-Trinitrobenzene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 20:55	ELC	A	
2,4,6-Trinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 20:55	ELC	A	
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*	*RegLmt*
3-Nitrochlorobenzene (S)	100		%	50-150	SW846 8330A	3/24/07	ELC	3/27/07 20:55	ELC	A	
WET CHEMISTRY											
Moisture	27.6		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
Total Solids	72.4		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
METALS											
Aluminum, Total	4790		mg/kg	13	SW846 6010B	3/22/07	CMD	3/23/07 08:36	TED	A1	
Antimony, Total	0.074J		mg/kg	0.26	SW846 6020	3/23/07	CMD	3/29/07 17:23	AJB	A2	
Copper, Total	2J		mg/kg	3	SW846 6010B	3/22/07	CMD	3/23/07 08:36	TED	A1	
Lead, Total	4.8		mg/kg	0.26	SW846 6020	3/23/07	CMD	3/29/07 17:23	AJB	A2	
Zinc, Total	9		mg/kg	3	SW846 6010B	3/22/07	CMD	3/23/07 08:36	TED	A1	

Sample Comments:

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ANALYTICAL RESULTS

Workorder: 9678547 FT STEWART -GA - REV 022607

Lab ID: **9678547007**
Sample ID: **FTSW-AA1-06**

Date Collected: 3/13/2007 17:00
Date Received: 3/17/2007 09:00

Matrix: Solid

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr	RegLmt
EXPLOSIVES											
2-Amino-4,6-Dinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 21:41	ELC	A	
4-Amino-2,6-dinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 21:41	ELC	A	
1,3-Dinitrobenzene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 21:41	ELC	A	
2,4-Dinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 21:41	ELC	A	
2,6-Dinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 21:41	ELC	A	
HMX	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 21:41	ELC	A	
Nitrobenzene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 21:41	ELC	A	
4-Nitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 21:41	ELC	A	
2-Nitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 21:41	ELC	A	
3-Nitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 21:41	ELC	A	
RDX	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 21:41	ELC	A	
Tetryl	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 21:41	ELC	A	
1,3,5-Trinitrobenzene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 21:41	ELC	A	
2,4,6-Trinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 21:41	ELC	A	
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*	*RegLmt*
3-Nitrochlorobenzene (S)	104		%	50-150	SW846 8330A	3/24/07	ELC	3/27/07 21:41	ELC	A	
WET CHEMISTRY											
Moisture	5.4		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
Total Solids	94.6		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
METALS											
Aluminum, Total	7830		mg/kg	11	SW846 6010B	3/22/07	CMD	3/23/07 08:42	TED	A1	
Antimony, Total	0.016J		mg/kg	0.17	SW846 6020	3/23/07	CMD	3/29/07 17:26	AJB	A2	
Copper, Total	0.8J		mg/kg	2	SW846 6010B	3/22/07	CMD	3/23/07 08:42	TED	A1	
Lead, Total	4.4		mg/kg	0.17	SW846 6020	3/23/07	CMD	3/29/07 17:26	AJB	A2	
Zinc, Total	4		mg/kg	2	SW846 6010B	3/22/07	CMD	3/23/07 08:42	TED	A1	

Sample Comments:

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ANALYTICAL RESULTS

Workorder: 9678547 FT STEWART -GA - REV 022607

Lab ID: **9678547008** Date Collected: 3/14/2007 14:10 Matrix: Solid

Sample ID: **FTSW-SA1-07** Date Received: 3/17/2007 09:00

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr	RegLmt
WET CHEMISTRY											
Moisture	35.4		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
Total Solids	64.6		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
METALS											
Antimony, Total	0.056J		mg/kg	0.31	SW846 6020	3/23/07	CMD	3/29/07 17:29	AJB	A2	
Copper, Total	2J		mg/kg	3	SW846 6010B	3/22/07	CMD	3/23/07 08:48	TED	A1	
Lead, Total	6.8		mg/kg	0.31	SW846 6020	3/23/07	CMD	3/29/07 17:29	AJB	A2	

Sample Comments:

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ANALYTICAL RESULTS

Workorder: 9678547 FT STEWART -GA - REV 022607

Lab ID: **9678547009**

Sample ID: **FTSW-SA1-08**

Date Collected: 3/14/2007 14:50

Date Received: 3/17/2007 09:00

Matrix: Solid

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr	RegLmt
WET CHEMISTRY											
Moisture	12.1		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
Total Solids	87.9		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
METALS											
Antimony, Total	0.010J		mg/kg	0.21	SW846 6020	3/23/07	CMD	3/29/07 17:32	AJB	A2	
Copper, Total	6		mg/kg	2	SW846 6010B	3/22/07	CMD	3/23/07 08:54	TED	A1	
Lead, Total	6.1		mg/kg	0.21	SW846 6020	3/23/07	CMD	3/29/07 17:32	AJB	A2	

Sample Comments:

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ANALYTICAL RESULTS

Workorder: 9678547 FT STEWART -GA - REV 022607

Lab ID: **9678547010**
Sample ID: **FTSW-SA1-09**

Date Collected: 3/14/2007 15:45
Date Received: 3/17/2007 09:00

Matrix: Solid

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr	RegLmt
WET CHEMISTRY											
Moisture	30.4		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
Total Solids	69.6		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
METALS											
Antimony, Total	0.019J		mg/kg	0.28	SW846 6020	3/23/07	CMD	3/29/07 17:35	AJB	A1	
Copper, Total	0.8J		mg/kg	3	SW846 6010B	3/26/07	CMD	3/28/07 12:13	JWK	A2	
Lead, Total	5.2		mg/kg	0.28	SW846 6020	3/23/07	CMD	3/29/07 17:35	AJB	A1	

Sample Comments:

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ANALYTICAL RESULTS

Workorder: 9678547 FT STEWART -GA - REV 022607

Lab ID: **9678547011** Date Collected: 3/14/2007 16:05 Matrix: Solid

Sample ID: **FTSW-SA1-10** Date Received: 3/17/2007 09:00

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr	RegLmt
WET CHEMISTRY											
Moisture	32.6		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
Total Solids	67.4		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
METALS											
Antimony, Total	0.017J		mg/kg	0.26	SW846 6020	3/23/07	CMD	3/29/07 17:38	AJB	A1	
Copper, Total	1J		mg/kg	3	SW846 6010B	3/26/07	CMD	3/28/07 12:19	JWK	A2	
Lead, Total	7.9		mg/kg	0.26	SW846 6020	3/23/07	CMD	3/29/07 17:38	AJB	A1	

Sample Comments:

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ANALYTICAL RESULTS

Workorder: 9678547 FT STEWART -GA - REV 022607

Lab ID: **9678547012** Date Collected: 3/14/2007 17:15 Matrix: Water

Sample ID: **FTSW-SA3-SW01** Date Received: 3/17/2007 09:00

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr	RegLmt
METALS											
Antimony, Total	ND		mg/L	0.0020	SW846 6020	3/22/07	CMD	3/29/07 10:56	AJB	A2	
Copper, Total	0.005J		mg/L	0.011	SW846 6010B	3/22/07	CMD	3/26/07 13:11	JWK	A1	
Lead, Total	0.0003J		mg/L	0.0020	SW846 6020	3/22/07	CMD	3/29/07 10:56	AJB	A2	

Sample Comments:

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ANALYTICAL RESULTS

Workorder: 9678547 FT STEWART -GA - REV 022607

Lab ID: **9678547013** Date Collected: 3/14/2007 17:25 Matrix: Water

Sample ID: **FTSW-SA3-SW02** Date Received: 3/17/2007 09:00

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr	RegLmt
METALS											
Antimony, Total	ND		mg/L	0.0020	SW846 6020	3/22/07	CMD	3/29/07 11:01	AJB	A2	
Copper, Total	0.005J		mg/L	0.011	SW846 6010B	3/22/07	CMD	3/26/07 13:15	JWK	A1	
Lead, Total	0.0008J		mg/L	0.0020	SW846 6020	3/22/07	CMD	3/29/07 11:01	AJB	A2	

Sample Comments:

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ANALYTICAL RESULTS

Workorder: 9678547 FT STEWART -GA - REV 022607

Lab ID: **9678547014** Date Collected: 3/15/2007 12:05 Matrix: Solid

Sample ID: **FTSW-HRT-11** Date Received: 3/17/2007 09:00

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr	RegLmt
EXPLOSIVES											
2-Amino-4,6-Dinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 22:27	ELC	A	
4-Amino-2,6-dinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 22:27	ELC	A	
1,3-Dinitrobenzene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 22:27	ELC	A	
2,4-Dinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 22:27	ELC	A	
2,6-Dinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 22:27	ELC	A	
HMX	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 22:27	ELC	A	
Nitrobenzene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 22:27	ELC	A	
4-Nitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 22:27	ELC	A	
2-Nitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 22:27	ELC	A	
3-Nitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 22:27	ELC	A	
RDX	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 22:27	ELC	A	
Tetryl	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 22:27	ELC	A	
1,3,5-Trinitrobenzene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 22:27	ELC	A	
2,4,6-Trinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 22:27	ELC	A	
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*	*RegLmt*
3-Nitrochlorobenzene (S)	109		%	50-150	SW846 8330A	3/24/07	ELC	3/27/07 22:27	ELC	A	
WET CHEMISTRY											
Moisture	23.8		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
Total Solids	76.2		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
METALS											
Aluminum, Total	1390		mg/kg	11	SW846 6010B	3/26/07	CMD	3/28/07 12:25	JWK	A2	
Antimony, Total	0.83		mg/kg	0.26	SW846 6020	3/23/07	CMD	3/29/07 17:40	AJB	A1	
Copper, Total	1J		mg/kg	2	SW846 6010B	3/26/07	CMD	3/28/07 12:25	JWK	A2	
Lead, Total	25.8		mg/kg	0.26	SW846 6020	3/23/07	CMD	3/29/07 17:40	AJB	A1	
Zinc, Total	2J		mg/kg	2	SW846 6010B	3/26/07	CMD	3/28/07 12:25	JWK	A2	

Sample Comments:

Raymond J. Martrano
Laboratory Manager

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ANALYTICAL RESULTS

Workorder: 9678547 FT STEWART -GA - REV 022607

Lab ID: **9678547015** Date Collected: 3/15/2007 18:45 Matrix: Solid
Sample ID: **FTSW-SA3-13** Date Received: 3/17/2007 09:00

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr	RegLmt
WET CHEMISTRY											
Moisture	26.7		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
Total Solids	73.3		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
METALS											
Antimony, Total	0.026J		mg/kg	0.21	SW846 6020	3/23/07	CMD	3/29/07 17:49	AJB	A1	
Copper, Total	1J		mg/kg	2	SW846 6010B	3/26/07	CMD	3/28/07 12:31	JWK	A2	
Lead, Total	8.6		mg/kg	0.21	SW846 6020	3/23/07	CMD	3/29/07 17:49	AJB	A1	

Sample Comments:

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ANALYTICAL RESULTS

Workorder: 9678547 FT STEWART -GA - REV 022607

Lab ID: **9678547016**
Sample ID: **FTSW-SA3-14**

Date Collected: 3/15/2007 18:55
Date Received: 3/17/2007 09:00

Matrix: Solid

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr	RegLmt
WET CHEMISTRY											
Moisture	31.2		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
Total Solids	68.8		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
METALS											
Antimony, Total	0.017J	1	mg/kg	0.15	SW846 6020	4/2/07	CMD	4/4/07 16:40	AJB	A3	
Copper, Total	0.8J		mg/kg	2	SW846 6010B	3/26/07	CMD	3/28/07 12:37	JWK	A2	
Lead, Total	4.6		mg/kg	0.15	SW846 6020	4/2/07	CMD	4/5/07 03:08	AJB	A3	

Sample Comments:

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ANALYTICAL RESULTS

Workorder: 9678547 FT STEWART -GA - REV 022607

Lab ID: **9678547017** Date Collected: 3/15/2007 18:30 Matrix: Solid

Sample ID: **FTSW-SA3-12** Date Received: 3/17/2007 09:00

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr	RegLmt
WET CHEMISTRY											
Moisture	27.9		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
Total Solids	72.1		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
METALS											
Antimony, Total	0.072J		mg/kg	0.24	SW846 6020	3/23/07	CMD	3/29/07 18:06	AJB	A1	
Copper, Total	1J		mg/kg	3	SW846 6010B	3/26/07	CMD	3/28/07 13:23	JWK	A2	
Lead, Total	6.7		mg/kg	0.24	SW846 6020	3/23/07	CMD	3/29/07 18:06	AJB	A1	

Sample Comments:

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ANALYTICAL RESULTS

Workorder: 9678547 FT STEWART -GA - REV 022607

Lab ID: **9678547018** Date Collected: 3/15/2007 18:30 Matrix: Solid
Sample ID: **FTSW-SA3-12D** Date Received: 3/17/2007 09:00

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr	RegLmt
WET CHEMISTRY											
Moisture	28.1		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
Total Solids	71.9		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
METALS											
Antimony, Total	0.039J		mg/kg	0.19	SW846 6020	3/23/07	CMD	3/29/07 18:09	AJB	A1	
Copper, Total	1J		mg/kg	2	SW846 6010B	3/26/07	CMD	3/28/07 13:29	JWK	A2	
Lead, Total	6.6		mg/kg	0.19	SW846 6020	3/23/07	CMD	3/29/07 18:09	AJB	A1	

Sample Comments:

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ANALYTICAL RESULTS

Workorder: 9678547 FT STEWART -GA - REV 022607

Lab ID: **9678547019**
Sample ID: **FTSW-SA3-SD02**
Date Collected: 3/14/2007 17:45
Date Received: 3/17/2007 09:00
Matrix: Solid

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr	RegLmt
WET CHEMISTRY											
Moisture	23.5		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
Total Solids	76.5		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
METALS											
Antimony, Total	0.017J	1	mg/kg	0.24	SW846 6020	3/26/07	CMD	3/29/07 18:26	AJB	A2	
Copper, Total	2J		mg/kg	2	SW846 6010B	3/26/07	CMD	3/28/07 13:35	JWK	A1	
Lead, Total	5.4		mg/kg	0.24	SW846 6020	3/26/07	CMD	3/29/07 18:26	AJB	A2	

Sample Comments:

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ANALYTICAL RESULTS

Workorder: 9678547 FT STEWART -GA - REV 022607

Lab ID: **9678547020**
Sample ID: **FTSW-SA3-SD01**
Date Collected: 3/14/2007 18:00
Date Received: 3/17/2007 09:00
Matrix: Solid

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr	RegLmt
WET CHEMISTRY											
Moisture	16.7		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
Total Solids	83.3		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
METALS											
Antimony, Total	0.084J		mg/kg	0.19	SW846 6020	3/23/07	CMD	3/29/07 18:12	AJB	A1	
Copper, Total	0.4J		mg/kg	2	SW846 6010B	3/26/07	CMD	3/28/07 13:52	JWK	A2	
Lead, Total	1.4		mg/kg	0.19	SW846 6020	3/23/07	CMD	3/29/07 18:12	AJB	A1	

Sample Comments:

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ANALYTICAL RESULTS

Workorder: 9678547 FT STEWART -GA - REV 022607

Lab ID: **9678547021** Date Collected: 3/14/2007 18:00 Matrix: Solid
Sample ID: **FTSW-SA3-SD01-D** Date Received: 3/17/2007 09:00

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr	RegLmt
WET CHEMISTRY											
Moisture	16.1		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
Total Solids	83.9		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
METALS											
Antimony, Total	0.032J		mg/kg	0.20	SW846 6020	3/26/07	CMD	3/29/07 18:40	AJB	A2	
Copper, Total	0.4J		mg/kg	2	SW846 6010B	3/26/07	CMD	3/28/07 13:58	JWK	A1	
Lead, Total	1.1		mg/kg	0.20	SW846 6020	3/26/07	CMD	3/29/07 18:40	AJB	A2	

Sample Comments:

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ANALYTICAL RESULTS QUALIFIERS\FLAGS

Workorder: 9678547 FT STEWART -GA - REV 022607

PARAMETER QUALIFIERS\FLAGS

[1] The recovery of the Matrix Spike (MS) associated to this analyte was outside of the established control limits. The sample was post-digestion spiked, and this matrix spike was within acceptable recovery limits.

[2] One of the two matrix spike analyses performed on this sample failed to meet acceptable recovery limits. The other matrix spike was within acceptable recovery limits. Matrix interferences are the possible cause for the failure.

QUALITY CONTROL DATA

Workorder: 9678547 FT STEWART -GA - REV 022607

QC Batch: HPLC/1766 Analysis Method: SW846 8330A

QC Batch Method: SW846 8330A

Associated Lab Samples: 9678547001 9678547002 9678547003 9678547004 9678547005 9678547006 9678547007 9678547014

METHOD BLANK: 349700

Parameter	Result	Qualifiers	Units	Reporting Limit
2-Amino-4,6-Dinitrotoluene	ND		ug/kg	250
4-Amino-2,6-dinitrotoluene	ND		ug/kg	250
1,3-Dinitrobenzene	ND		ug/kg	250
2,4-Dinitrotoluene	ND		ug/kg	250
2,6-Dinitrotoluene	ND		ug/kg	250
HMX	ND		ug/kg	250
Nitrobenzene	ND		ug/kg	250
4-Nitrotoluene	ND		ug/kg	250
2-Nitrotoluene	ND		ug/kg	250
3-Nitrotoluene	ND		ug/kg	250
RDX	ND		ug/kg	250
Tetryl	ND		ug/kg	250
1,3,5-Trinitrobenzene	ND		ug/kg	250
2,4,6-Trinitrotoluene	ND		ug/kg	250
Surrogate Recoveries				
3-Nitrochlorobenzene	99		%	50-150

LABORATORY CONTROL SAMPLE: 349701

Parameter	LCS Result	Qualifiers	Units	Spike Conc.	LCS % Rec	% Rec Limits
2-Amino-4,6-Dinitrotoluene	840		ug/kg	1000	84	70-130
4-Amino-2,6-dinitrotoluene	826		ug/kg	1000	83	70-130
1,3-Dinitrobenzene	868		ug/kg	1000	87	70-130
2,4-Dinitrotoluene	747		ug/kg	1000	75	70-130
2,6-Dinitrotoluene	818		ug/kg	1000	82	70-130
HMX	794		ug/kg	1000	79	70-130
Nitrobenzene	860		ug/kg	1000	86	70-130
4-Nitrotoluene	900		ug/kg	1000	90	70-130
2-Nitrotoluene	889		ug/kg	1000	89	70-130
3-Nitrotoluene	883		ug/kg	1000	88	70-130
RDX	872		ug/kg	1000	87	70-130
Tetryl	433		ug/kg	1000	43	70-130
1,3,5-Trinitrobenzene	700		ug/kg	1000	70	70-130
2,4,6-Trinitrotoluene	822		ug/kg	1000	82	70-130
Surrogate Recoveries						
3-Nitrochlorobenzene			%		98	50-150

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QUALITY CONTROL DATA

Workorder: 9678547 FT STEWART -GA - REV 022607

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 349702 349703 Original: 9678547005

*****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.*

Parameter	Original Result	Qualifiers	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
2-Amino-4,6-Dinitrotoluene	0		ug/kg	952	781	877	82	86	70-130	4.8	50
4-Amino-2,6-dinitrotoluene	0		ug/kg	952	704	792	74	78	70-130	5.3	50
1,3-Dinitrobenzene	0		ug/kg	952	828	918	87	90	70-130	3.4	50
2,4-Dinitrotoluene	0		ug/kg	952	733	825	77	81	70-130	5.1	50
2,6-Dinitrotoluene	0		ug/kg	952	818	913	86	90	70-130	4.5	50
HMX	0		ug/kg	952	754	831	79	82	70-130	3.7	50
Nitrobenzene	0		ug/kg	952	788	883	83	87	70-130	4.7	50
4-Nitrotoluene	0		ug/kg	952	892	1040	94	103	70-130	9.1	50
2-Nitrotoluene	0		ug/kg	952	875	935	92	92	70-130	0	50
3-Nitrotoluene	0		ug/kg	952	833	995	87	98	70-130	12	50
RDX	0		ug/kg	952	835	866	88	85	70-130	3.5	50
Tetryl	0		ug/kg	952	689	749	72	74	20-175	2.7	50
1,3,5-Trinitrobenzene	0		ug/kg	952	750	820	79	81	70-130	2.5	50
2,4,6-Trinitrotoluene	0		ug/kg	952	768	848	81	84	70-130	3.6	50
Surrogate Recoveries											
3-Nitrochlorobenzene	100		%				99	102	50-150	3	

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QUALITY CONTROL DATA

Workorder: 9678547 FT STEWART -GA - REV 022607

QC Batch:	MDIG/14329		Analysis Method:	SW846 6010B		
QC Batch Method:	SW846 3050					
Associated Lab Samples:	9678547001	9678547002	9678547003	9678547004	9678547005	9678547006
	9678547007	9678547008	9678547009			

METHOD BLANK: 350298

Parameter	Result	Qualifiers	Units	Reporting Limit
Aluminum, Total	ND		mg/kg	10
Copper, Total	ND		mg/kg	2
Zinc, Total	ND		mg/kg	2

LABORATORY CONTROL SAMPLE: 350299

Parameter	LCS Result	Qualifiers	Units	Spike Conc.	LCS % Rec	% Rec Limits
Aluminum, Total	115		mg/kg	100	115	80-120
Copper, Total	107		mg/kg	100	107	80-120
Zinc, Total	112		mg/kg	100	112	80-120

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 350300 350301 Original: 9678547005

*****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.*

Parameter	Original Result	Qualifiers	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Aluminum, Total	2610	3	mg/kg	81	3040	2900	396	232	75-125	52	25
Copper, Total	2		mg/kg	81	92	92	108	107	75-125	0.9	25
Zinc, Total	12		mg/kg	81	107	105	112	110	75-125	1.8	25

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QUALITY CONTROL DATA

Workorder: 9678547 FT STEWART -GA - REV 022607

QC Batch: MDIG/14334 Analysis Method: SW846 6010B

QC Batch Method: SW846 3015

Associated Lab Samples: 9678547012 9678547013

METHOD BLANK: 350318

Parameter	Result	Qualifiers	Units	Reporting Limit
Copper, Total	0.002J		mg/L	0.011

LABORATORY CONTROL SAMPLE: 350319

Parameter	LCS Result	Qualifiers	Units	Spike Conc.	LCS % Rec	% Rec Limits
Copper, Total	1.07		mg/L	1.11	96	80-120

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 350320 350321 Original: 9678547013

*****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.*

Parameter	Original Result	Qualifiers	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Copper, Total	0.005		mg/L	1.11	1.10	1.12	99	101	75-125	2	20

QUALITY CONTROL DATA

Workorder: 9678547 FT STEWART -GA - REV 022607

QC Batch: MDIG/14335 Analysis Method: SW846 6020

QC Batch Method: SW846 3015

Associated Lab Samples: 9678547012 9678547013

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 350324 350325 Original: 9678547013

*****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.*

Parameter	Original Result	Qualifiers	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Antimony, Total	3e-005		mg/L	0.111	0.110	0.110	99	99	75-125	0	20
Lead, Total	0.0008		mg/L	0.111	0.109	0.114	98	102	75-125	4	20

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QUALITY CONTROL DATA

Workorder: 9678547 FT STEWART -GA - REV 022607

QC Batch: MDIG/14345 Analysis Method: SW846 6020

QC Batch Method: SW846 3050

Associated Lab Samples: 9678547001 9678547002 9678547003 9678547004 9678547005 9678547006 9678547007 9678547008 9678547009 9678547010 9678547011 9678547014 9678547015 9678547017 9678547018 9678547020

METHOD BLANK: 350677

Parameter	Result	Qualifiers	Units	Reporting Limit
Antimony, Total	0.0063J		mg/kg	0.20
Lead, Total	0.017J		mg/kg	0.20

LABORATORY CONTROL SAMPLE: 350678

Parameter	LCS Result	Qualifiers	Units	Spike Conc.	LCS % Rec	% Rec Limits
Antimony, Total	9.5		mg/kg	10	95	80-120
Lead, Total	10.4		mg/kg	10	104	80-120

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 350679 350680 Original: 9678547005

*****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.*

Parameter	Original Result	Qualifiers	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Antimony, Total	0.19		mg/kg	5.9	0.99	1.7	13	24	75-125	59	20
Lead, Total	19.1		mg/kg	5.9	81.5	25.3	1010	88	75-125	168	20

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QUALITY CONTROL DATA

Workorder: 9678547 FT STEWART -GA - REV 022607

QC Batch: MDIG/14355 Analysis Method: SW846 6010B

QC Batch Method: SW846 3050

Associated Lab Samples: 9678547010 9678547011 9678547014 9678547015 9678547016 9678547017 9678547018 9678547019 9678547020 9678547021

METHOD BLANK: 351058

Parameter	Result	Qualifiers	Units	Reporting Limit
Aluminum, Total	ND		mg/kg	10
Copper, Total	0.6J		mg/kg	2
Zinc, Total	ND		mg/kg	2

LABORATORY CONTROL SAMPLE: 351059

Parameter	LCS Result	Qualifiers	Units	Spike Conc.	LCS % Rec	% Rec Limits
Aluminum, Total	115		mg/kg	100	115	80-120
Copper, Total	104		mg/kg	100	104	80-120
Zinc, Total	114		mg/kg	100	114	80-120

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 351060 351061 Original: 9678547016

*****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.*

Parameter	Original Result	Qualifiers	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Aluminum, Total			mg/kg		1000	1130					
Copper, Total	0.5		mg/kg	57	88	88	106	105	75-125	0.9	25
Zinc, Total			mg/kg		99	98					

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 351062 351063 Original: 9678547019

*****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.*

Parameter	Original Result	Qualifiers	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Aluminum, Total			mg/kg		2390	1840					
Copper, Total	1		mg/kg	80	110	110	104	104	75-125	0	25
Zinc, Total			mg/kg		124	123					

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QUALITY CONTROL DATA

Workorder: 9678547 FT STEWART -GA - REV 022607

QC Batch: MDIG/14356 Analysis Method: SW846 6020

QC Batch Method: SW846 3050

Associated Lab Samples: 9678547019 9678547021

METHOD BLANK: 351064

Parameter	Result	Qualifiers	Units	Reporting Limit
Antimony, Total	ND		mg/kg	0.20
Lead, Total	0.024J		mg/kg	0.20

LABORATORY CONTROL SAMPLE: 351065

Parameter	LCS Result	Qualifiers	Units	Spike Conc.	LCS % Rec	% Rec Limits
Antimony, Total	9.6		mg/kg	10	96	80-120
Lead, Total	9.3		mg/kg	10	93	80-120

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 351066 351067 Original: 9678547019

****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.*

Parameter	Original Result	Qualifiers	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Antimony, Total	0.013		mg/kg	9.3	2.1	2.4	18	20	75-125	11	20
Lead, Total	4.1		mg/kg	9.3	15.7	15.8	86	88	75-125	2.3	20

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QUALITY CONTROL DATA

Workorder: 9678547 FT STEWART -GA - REV 022607

QC Batch: MDIG/14429 Analysis Method: SW846 6020

QC Batch Method: SW846 3050

Associated Lab Samples: 9678547016 9679276001 9679276002 9679276003 9679276004 9679276005 9679276006 9679276007 9679276008 9679276009 9679276010 9679276011

METHOD BLANK: 352808

Parameter	Result	Qualifiers	Units	Reporting Limit
Antimony, Total	0.023J		mg/kg	0.20

METHOD BLANK: 352808

Parameter	Result	Qualifiers	Units	Reporting Limit
Lead, Total	0.0077J		mg/kg	0.20

LABORATORY CONTROL SAMPLE: 352809

Parameter	LCS Result	Qualifiers	Units	Spike Conc.	LCS % Rec	% Rec Limits
Antimony, Total	9.6		mg/kg	10	96	80-120

LABORATORY CONTROL SAMPLE: 352809

Parameter	LCS Result	Qualifiers	Units	Spike Conc.	LCS % Rec	% Rec Limits
Lead, Total	9.6		mg/kg	10	96	80-120

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 352810 352811 Original: 9678547016

*****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.*

Parameter	Original Result	Qualifiers	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Antimony, Total	0.012		mg/kg	5.2	2.8	2.9	36	39	75-125	8	20

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 352810 352811 Original: 9678547016

*****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.*

Parameter	Original Result	Qualifiers	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Lead, Total	3.2		mg/kg	5.2	12.5	12.4	103	104	75-125	1	20

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QUALITY CONTROL DATA

Workorder: 9678547 FT STEWART -GA - REV 022607

QC Batch: WETC/40012 Analysis Method: SM20-2540 G

QC Batch Method: SM20-2540 G

Associated Lab Samples: 9678547001 9678547002 9678547003 9678547004 9678547005 9678547006 9678547007 9678547008 9678547009 9678547010 9678547011 9678547014 9678547015 9678547016 9678547017 9678547018 9678547019 9678547020 9678547021

SAMPLE DUPLICATE: 349371 Original: 9678542001

*****NOTE - The Original Result and Duplicate Result shown below are raw results and are only used for the purpose of calculating Sample Duplicate percent recoveries. This result is not a final value and cannot be used as such.*

Parameter	Original Result	Qualifiers	Units	DUP Result	RPD	Max RPD
Moisture	14.9		%	14.5	2.7	10
Total Solids	85.1		%	85.5	0.5	5

SAMPLE DUPLICATE: 349372 Original: 9678542011

*****NOTE - The Original Result and Duplicate Result shown below are raw results and are only used for the purpose of calculating Sample Duplicate percent recoveries. This result is not a final value and cannot be used as such.*

Parameter	Original Result	Qualifiers	Units	DUP Result	RPD	Max RPD
Moisture	12.3		%	12.0	2.5	10
Total Solids	87.7		%	88.0	0.3	5

SAMPLE DUPLICATE: 349376 Original: 9678547016

*****NOTE - The Original Result and Duplicate Result shown below are raw results and are only used for the purpose of calculating Sample Duplicate percent recoveries. This result is not a final value and cannot be used as such.*

Parameter	Original Result	Qualifiers	Units	DUP Result	RPD	Max RPD
Moisture	31.2		%	32.0	2.5	10
Total Solids	68.8		%	68.0	1.2	5

SAMPLE DUPLICATE: 349377 Original: 9678547005

*****NOTE - The Original Result and Duplicate Result shown below are raw results and are only used for the purpose of calculating Sample Duplicate percent recoveries. This result is not a final value and cannot be used as such.*

Parameter	Original Result	Qualifiers	Units	DUP Result	RPD	Max RPD
Moisture	3.5		%	3.5	0	10
Total Solids	96.5		%	96.5	0	5

SAMPLE DUPLICATE: 349378 Original: 9678547019

*****NOTE - The Original Result and Duplicate Result shown below are raw results and are only used for the purpose of calculating Sample Duplicate percent recoveries. This result is not a final value and cannot be used as such.*

Parameter	Original Result	Qualifiers	Units	DUP Result	RPD	Max RPD
Moisture	23.5		%	25.6	8.6	10
Total Solids	76.5		%	74.4	2.8	5

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QUALITY CONTROL DATA QUALIFIERS\FLAGS

Workorder: 9678547 FT STEWART -GA - REV 022607

QUALITY CONTROL PARAMETER QUALIFIERS

[3] The concentration of this analyte was greater than ten times the concentration of the spike added to the matrix spike. According to protocol, the calculation for percent recovery of the matrix spike is not valid.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 9678547 FT STEWART -GA - REV 022607

Lab ID	Sample ID	Prep Batch Method	Prep Batch	Analytical Method	Analytical Batch
9678547001	FTSW-HGC-01	SW846 8330A	HPLC/1766	SW846 8330A	HPLC/1773
9678547002	FTSW-AA90MM2-02	SW846 8330A	HPLC/1766	SW846 8330A	HPLC/1773
9678547003	FTSW-AA1-03	SW846 8330A	HPLC/1766	SW846 8330A	HPLC/1773
9678547004	FTSW-AA-03D	SW846 8330A	HPLC/1766	SW846 8330A	HPLC/1773
9678547005	FTSW-AA-04	SW846 8330A	HPLC/1766	SW846 8330A	HPLC/1773
9678547006	FTSW-AA1-05	SW846 8330A	HPLC/1766	SW846 8330A	HPLC/1773
9678547007	FTSW-AA1-06	SW846 8330A	HPLC/1766	SW846 8330A	HPLC/1773
9678547014	FTSW-HRT-11	SW846 8330A	HPLC/1766	SW846 8330A	HPLC/1773
9678547001	FTSW-HGC-01	SW846 3050	MDIG/14329	SW846 6010B	META/16178
9678547002	FTSW-AA90MM2-02	SW846 3050	MDIG/14329	SW846 6010B	META/16178
9678547003	FTSW-AA1-03	SW846 3050	MDIG/14329	SW846 6010B	META/16178
9678547004	FTSW-AA-03D	SW846 3050	MDIG/14329	SW846 6010B	META/16178
9678547005	FTSW-AA-04	SW846 3050	MDIG/14329	SW846 6010B	META/16178
9678547006	FTSW-AA1-05	SW846 3050	MDIG/14329	SW846 6010B	META/16178
9678547007	FTSW-AA1-06	SW846 3050	MDIG/14329	SW846 6010B	META/16178
9678547008	FTSW-SA1-07	SW846 3050	MDIG/14329	SW846 6010B	META/16178
9678547009	FTSW-SA1-08	SW846 3050	MDIG/14329	SW846 6010B	META/16178
9678547012	FTSW-SA3-SW01	SW846 3015	MDIG/14334	SW846 6010B	META/16194
9678547013	FTSW-SA3-SW02	SW846 3015	MDIG/14334	SW846 6010B	META/16194
9678547010	FTSW-SA1-09	SW846 3050	MDIG/14355	SW846 6010B	META/16228
9678547011	FTSW-SA1-10	SW846 3050	MDIG/14355	SW846 6010B	META/16228
9678547014	FTSW-HRT-11	SW846 3050	MDIG/14355	SW846 6010B	META/16228
9678547015	FTSW-SA3-13	SW846 3050	MDIG/14355	SW846 6010B	META/16228
9678547016	FTSW-SA3-14	SW846 3050	MDIG/14355	SW846 6010B	META/16228
9678547017	FTSW-SA3-12	SW846 3050	MDIG/14355	SW846 6010B	META/16228
9678547018	FTSW-SA3-12D	SW846 3050	MDIG/14355	SW846 6010B	META/16228
9678547019	FTSW-SA3-SD02	SW846 3050	MDIG/14355	SW846 6010B	META/16228
9678547020	FTSW-SA3-SD01	SW846 3050	MDIG/14355	SW846 6010B	META/16228
9678547021	FTSW-SA3-SD01-D	SW846 3050	MDIG/14355	SW846 6010B	META/16228
9678547012	FTSW-SA3-SW01	SW846 3015	MDIG/14335	SW846 6020	META/16247
9678547013	FTSW-SA3-SW02	SW846 3015	MDIG/14335	SW846 6020	META/16247
9678547001	FTSW-HGC-01	SW846 3050	MDIG/14345	SW846 6020	META/16258
9678547002	FTSW-AA90MM2-02	SW846 3050	MDIG/14345	SW846 6020	META/16258
9678547003	FTSW-AA1-03	SW846 3050	MDIG/14345	SW846 6020	META/16258
9678547004	FTSW-AA-03D	SW846 3050	MDIG/14345	SW846 6020	META/16258

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 9678547 FT STEWART -GA - REV 022607

Lab ID	Sample ID	Prep Batch Method	Prep Batch	Analytical Method	Analytical Batch
9678547005	**FTSW-AA-04**	SW846 3050	MDIG/14345	SW846 6020	META/16258
9678547006	**FTSW-AA1-05**	SW846 3050	MDIG/14345	SW846 6020	META/16258
9678547007	**FTSW-AA1-06**	SW846 3050	MDIG/14345	SW846 6020	META/16258
9678547008	**FTSW-SA1-07**	SW846 3050	MDIG/14345	SW846 6020	META/16258
9678547009	**FTSW-SA1-08**	SW846 3050	MDIG/14345	SW846 6020	META/16258
9678547010	**FTSW-SA1-09**	SW846 3050	MDIG/14345	SW846 6020	META/16258
9678547011	**FTSW-SA1-10**	SW846 3050	MDIG/14345	SW846 6020	META/16258
9678547014	**FTSW-HRT-11**	SW846 3050	MDIG/14345	SW846 6020	META/16258
9678547015	**FTSW-SA3-13**	SW846 3050	MDIG/14345	SW846 6020	META/16258
9678547017	**FTSW-SA3-12**	SW846 3050	MDIG/14345	SW846 6020	META/16258
9678547018	**FTSW-SA3-12D**	SW846 3050	MDIG/14345	SW846 6020	META/16258
9678547019	**FTSW-SA3-SD02**	SW846 3050	MDIG/14356	SW846 6020	META/16258
9678547020	**FTSW-SA3-SD01**	SW846 3050	MDIG/14345	SW846 6020	META/16258
9678547021	**FTSW-SA3-SD01-D**	SW846 3050	MDIG/14356	SW846 6020	META/16258
9678547016	**FTSW-SA3-14**	SW846 3050	MDIG/14429	SW846 6020	META/16326
9678547016	**FTSW-SA3-14**	SW846 3050	MDIG/14429	SW846 6020	META/16334
9678547001	**FTSW-HGC-01**			SM20-2540 G	WETC/40012
9678547002	**FTSW-AA90MM2-02**			SM20-2540 G	WETC/40012
9678547003	**FTSW-AA1-03**			SM20-2540 G	WETC/40012
9678547004	**FTSW-AA-03D**			SM20-2540 G	WETC/40012
9678547005	**FTSW-AA-04**			SM20-2540 G	WETC/40012
9678547006	**FTSW-AA1-05**			SM20-2540 G	WETC/40012
9678547007	**FTSW-AA1-06**			SM20-2540 G	WETC/40012
9678547008	**FTSW-SA1-07**			SM20-2540 G	WETC/40012
9678547009	**FTSW-SA1-08**			SM20-2540 G	WETC/40012
9678547010	**FTSW-SA1-09**			SM20-2540 G	WETC/40012
9678547011	**FTSW-SA1-10**			SM20-2540 G	WETC/40012
9678547014	**FTSW-HRT-11**			SM20-2540 G	WETC/40012
9678547015	**FTSW-SA3-13**			SM20-2540 G	WETC/40012
9678547016	**FTSW-SA3-14**			SM20-2540 G	WETC/40012
9678547017	**FTSW-SA3-12**			SM20-2540 G	WETC/40012
9678547018	**FTSW-SA3-12D**			SM20-2540 G	WETC/40012
9678547019	**FTSW-SA3-SD02**			SM20-2540 G	WETC/40012
9678547020	**FTSW-SA3-SD01**			SM20-2540 G	WETC/40012
9678547021	**FTSW-SA3-SD01-D**			SM20-2540 G	WETC/40012

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CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS

ALL SHADED AREAS MUST BE COMPLETED BY THE CLIENT / SAMPLER. INSTRUCTIONS ON THE BACK.

* 9 6 7 8 5 4 7 *

Client Name: Malcolm Pirnie
Address: 300 E. Lombard St, Suite 610 Baltimore, MD 21202
Contact: David Smith
Phone#: 410 332-4809
Project Name/#: 2118093 Fort Stewart
Bill To: MP
TAT: [X] Normal-Standard TAT is 10-12 business days. [ ] Rush-Subject to ALSI approval and surcharges.
Date Required: ____ Approved By: ____
Email? [X] -Y dsmith@pirnie.com
Fax? [ ] -Y No.: Malcolm Pirnie

***Container Type / ***Container Size / *** Preservative

ANALYSES/METHOD REQUESTED

Enter Number of Containers Per Analysis Requested or Field Results Below.

	Sample Description/Location (as it will appear on the lab report)	Sample Date	Military Time	*G or C	**Matrix	EPA Method 6010B Copper	EPA Method 6020 Lead, Antimony	EPA Method 6010B Copper, Aluminum, Zinc	EPA Method 6020 Lead, Antimony	EPA Method 8330 Explosives	Sample/COC Comments
1	FTSW-HGB-01	3-13-07	1355	C	SO			1	1	1	2 containers total / metals in one jar
2	FTSW-AA10MM2-02	3-13-07	1500	C	SO			1	1	1	2 jars total metals in one
3	FTSW-AA1-03	3-13-07	1605	C	SO			1	1	1	2 JARS metals in one
4	FTSW-AA-03D	3-13-07	1605	C	SO			1	1	1	
5	FTSW-AA-04	3-13-07	1620	C	SO			1	1	1	
5 6	FTSW-AA-04 MS	3-13-07	1620	C	SO			1	1	1	
7	FTSW-AA-04MSD	3-13-07	1620	C	SO			1	1	1	
6 8	FTSW-AA1-05	3-13-07	1645	C	SO			1	1	1	
7 9	FTSW-AA1-06	3-13-07	1700	C	SO			1	1	1	3/19/07 KK
8 10	FTSW-SA1-07	3/14-07	1410	C	SO	1	1				One JAR Total

SAMPLED BY (Please Print): DAVE Smith / Nicole Skelly (UKWZ)
LOGGED BY(signature): [signature] DATE: 3-15-07 TIME: 9Am
REVIEWED BY(signature): DATE: TIME:

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time
1			2 [signature]	3/17	900
3			4		
5			6		
7			8		
9			10		

Receipt Information (completed by Receiving Lab)
Cooler Temp: 1 Therm. ID: 51023559
No. of Coolers: ____

	Y	N	Initial
Custody Seals Present?		✓	
(if present) Seals Intact?			
Received on Ice?	✓		
COC/Labels Complete/Accurate?		✓	
Cont. In Good Cond.?	✓		
Correct Containers?	✓		
Correct Sample Volumes?	✓		
Correct Preservation?	✓		
Headspace/Volatiles?	✓		

Courier/Tracking #: FX 799105018240

Data Deliverables: [ ] Standard [ ] CLP-like [ ] NJ-Reduced [ ] NJ-Full [ ] (other)
EDDs Required? [ ] If yes, format type:
State Samples Collected In: NC / NJ / NY / PA / Other / PWSID
SDWA Forms Required? yes / yes / yes / yes
ALSI Field Services: [ ] Pickup [ ] Labor [ ] Composite Sampling [ ] Rental Equipment [ ] Other:
DOD Criteria Required?

* G=Grab; C=Composite
**Matrix: AI=Air; DW=Drinking Water; GW=Groundwater; OI=Oil; OL=Other Liquid; SL=Sludge; SO=Soil; WP=Wipe; WW=Wastewater
***Container Type: AG-Amber Glass; CG-Clear Glass, PL-Plastic. Container Size: 250ml, 500ml, 1L, 8oz., etc. Preservative: HCl, HNO3, NaOH, etc.

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CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS

ALL SHADED AREAS MUST BE COMPLETED BY THE CLIENT / SAMPLER. INSTRUCTIONS ON THE BACK.

COC #: 9678547 | 2 of 3

ALSI Quote #:

Client Name: Malcolm Pirnie

Address: 300 E. Lombard St. Suite 610 Baltimore, MD 21202

Contact: David Smith

Phone#: 410-332-4809

Project Name/#: ZI 18093 Fort Stewart

Bill To: MTI

TAT: [X] Normal-Standard TAT is 10-12 business days. [ ] Rush-Subject to ALSI approval and surcharges.

Date Required: ______ Approved By: ______

Email? [X]-Y dgsmith@pirnie.com

Fax? [ ]-Y No: Malcolm Pirnie

***Container Type / ***Container Size / *** Preservative

ANALYSES/METHOD REQUESTED

Enter Number of Containers Per Analysis Requested or Field Results Below.

	Sample Description/Location (as it will appear on the lab report)	Sample Date	Military Time	*G or C	**Matrix	EPA method 6010B Copper	EPA method 0020 Lead, Antimony	EPA method 6010B Copper, Aluminum, Zinc	EPA method 8330 Explosives	Sample/COC Comments
9	1 FTSW-SA1-08	3-14-07	1450	C	SO	1	1			1 Jar total
10	2 FTSW-SA1-09	3-14-07	1545	C	SO	1	1			1 Jar total
11	3 FTSW-SA2-10	3-14-07	1005	C	SO	1	1			1 Jar total
12	4 FTSW-SA3-SW01	3-14-07	1715	G	SW	1	1			1 Jar total
13	5 FTSW-SA3-SW02-MS	3-14-07	1725	G	SW	1	1			1 Jar total
13	6 FTSW-SA3-SW02-MSD	3-14-07	1725	G	SW	1	1			1 Jar total
13	7 FTSW-SA3-SW02	3-14-07	1725	G	SW	1	1			1 Jar total
14	8 FTSW-~~HR~~T-11	3-15-07	1205	C	SO		1	1	1	2 Jars total
15	9 FTSW-SA3-13	3-15-07	~~1855~~	C	SO	1	1			1 Jar total
14	10 FTSW-SA3-14	3-15-07	1895	C	SO	1	1			1 Jar total

ENTERED 3/19/07 1455

Receipt Information (completed by Receiving Lab)

Cooler Temp: 1 Therm. ID: 5/023559

No. of Coolers: ______

	Y	N	Initial
Custody Seals Present?		✓	KS
(if present) Seals Intact?			
Received on Ice?	✓		
COC/Labels Complete/Accurate?		✓	
Cont. in Good Cond.?	✓		
Correct Containers?	✓		
Correct Sample Volumes?	✓		
Correct Preservation?	✓		
Headspace/Volatiles?		✓	

Courier/Tracking #: 799185018740

SAMPLED BY (Please Print): Nicole Ukura, Dale Smith, Shelly Gilb

LOGGED BY (signature): [signature] DATE: 3-16-07 TIME: 9 AM

REVIEWED BY (signature): DATE: TIME:

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time
1			2 [signature]	3/17	900
3			4		
5			6		
7			8		
9			10		

Data Deliverables: [ ] Standard [ ] CLP-like [ ] NJ-Reduced [ ] NJ-Full [✓] ______

EDDs Required? [✓] If yes, format type: See Pm

State Samples Collected In: NC / NJ / NY / PA / Other / PWSID

SDWA Forms Required?: yes / yes / yes / yes

ALSI Field Services: [ ] Pickup [ ] Labor [ ] Composite Sampling [ ] Rental Equipment [ ] Other:

DOD Criteria Required? yes

* G=Grab; C=Composite

**Matrix: AI=Air; DW=Drinking Water; GW=Groundwater; OI=Oil; OL=Other Liquid; SL=Sludge; SO=Soil; WP=Wipe; WW=Wastewater

***Container Type: AG-Amber Glass; CG-Clear Glass, PL-Plastic. Container Size: 250ml, 500ml, 1L, 8oz., etc. Preservative: HCl, HNO3, NaOH, etc.

SW - Surface water

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Rev 5/06

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CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS

ALL SHADED AREAS MUST BE COMPLETED BY THE CLIENT / SAMPLER. INSTRUCTIONS ON THE BACK.

COC #: 9678947 — 3 of 3
ALSI Quote #:

Client Name: Malcolm Pirnie
Address: 300 E Lombard St, Suite 610, Baltimore MD 21202
Contact: David Smith
Phone#: 410 332-4809
Project Name/#: 2118-093 Fort Stewart
Bill To: MPI

TAT: [x] Normal-Standard TAT is 10-12 business days. [ ] Rush-Subject to ALSI approval and surcharges.
Date Required: Approved By:
Email? [x] Y dgsmith@pirnie.com
Fax? [ ] Y No.: Malcolm Pirnie

***Container Type / ***Container Size / ***Preservative

ANALYSES/METHOD REQUESTED: EPA Method 6010B Copper; EPA Method 6020 lead Antimony; Sb Cu, Pb

Enter Number of Containers Per Analysis Requested or Field Results Below.

	Sample Description/Location (as it will appear on the lab report)	Sample Date	Military Time	*G or C	**Matrix	EPA Method 6010B Copper	EPA Method 6020 lead Antimony	Sb Cu, Pb	Sample/COC Comments
16	1 FTSW-SA3-14MS	1885	3:1507	C	SO	1	1		1 Jar total
	2 FTSW-SA3-14MSD	1855	3:1507	C	SO	1	1		1 Jar total
17	5 FTSW-SA3-12	3:15:07	1830	C	SO	1	1		1 Jar total
18	6 FTSW-SA3-12D	3-15-07	1830	C	SO	1	1		1 Jar total
19	8 FTSW-SA3-SD02 (MS/MSD)	3-14-07	1745		S			3	(Added per Shelly @ Malcolm Pirnie) rcvd but not on COC.
20	8 FTSW-SA3-SD01	3-14-07	1800					1	SM 3-19-07
	7 FTSW-SA3-SD01-D	3-14-06	1800					1	
	8								
	9								
	10							SM 3/14/07 1455	

ENTERED

SAMPLED BY (Please Print): Nicole Sikus, David Smith, Shelly Koll
LOGGED BY (signature): [signature] DATE 3-16-07 TIME 9am
REVIEWED BY (signature):

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time
1			2 [signature]	3/17	900
3			4		
5			6		
7			8		
9			10		

Receipt Information (completed by Receiving Lab)
Cooler Temp: 1 Therm. ID: 51023589
No. of Coolers:

	Y	N	Initial
Custody Seals Present?		/	TJS
(if present) Seals Intact?			
Received on Ice?	/		
COC/Labels Complete/Accurate?		/	
Cont. in Good Cond.?	/		
Correct Containers?	/		
Correct Sample Volumes?	/		
Correct Preservation?	/		
Headspace/Volatiles?	/	/	

Courier/Tracking #: 7991 0501 5740

Data Deliverables: [ ] Standard [ ] CLP-like [ ] NJ-Reduced [ ] NJ-Full [ ] other
EDDs Required? [x] If yes, format type: see / m

State Samples Collected In: NC [ ] NJ [ ] NY [ ] PA [ ] Other ____ PWSID
SDWA Forms Required? yes [ ] yes [ ] yes [ ] yes [ ]
ALSI Field Services: [ ] Pickup [ ] Labor [ ] Composite Sampling [ ] Rental Equipment [ ] Other:

DOD Criteria Required? yes

* G=Grab; C=Composite **Matrix: AI=Air; DW=Drinking Water; GW=Groundwater; OI=Oil; OL=Other Liquid; SL=Sludge; SO=Soil; WP=Wipe; WW=Wastewater
Copies: WHITE-ORIGINAL CANARY-CUSTOMER COPY ***Container Type: AG-Amber Glass; CG-Clear Glass, PL-Plastic. Container Size: 250ml, 500ml, 1L, 8oz., etc. Preservative: HCl, HNO3, NaOH, etc.
Rev 5/06

PROJECT TITLE
Malcolm Pirnie – MD
Fort Stewart - GA

LABORATORY WORK ORDERS
9678547

SAMPLES COLLECTED
March 13-15, 2007

LIMS-QC
DATA PACKAGE

Prepared by:
Analytical Laboratory Services, Inc.

Date: 04/12/07

34 Dogwood Lane ✦ Middletown, PA 17057
TEL: 717-944-5541 ✦ FAX: 717-944-1430 ✦ Philadelphia 610-640-1323 ✦ Maryland 410-244-8889

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Certificate of Analysis

Project Name:	FT STEWART -GA - REV 022607	Workorder:	9678547
Purchase Order:		Workorder ID:	FT STEWART -GA - REV 022607

Mr. David Smith
Malcolm Pirnie-MD
300 East Lombard Street
Suite 610
Baltimore, MD 21202

April 12, 2007

Dear Mr. Smith,

Enclosed are the analytical results for samples received by the laboratory on Saturday, March 17, 2007

ALSI is a National Environmental Laboratory Accreditation Conference (NELAC) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAC.

If you have any questions regarding this certificate of analysis, please contact Tonya Hironimus (Project Coordinator) or Raymond Martrano (Laboratory Manager) at (717) 944-5541.

Please visit us at www.analyticallab.com for a listing of ALSI's NELAC accreditations and Scope of Work, as well as other links to Water Quality documentation on the internet.

This laboratory report may not be reproduced, except in full, without the written approval of ALSI.

Analytical Laboratory Services, Inc.

Raymond J. Martrano
Laboratory Manager

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

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SAMPLE SUMMARY

Workorder: 9678547 FT STEWART -GA - REV 022607 Discard Date: 06/11/2007

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
9678547001	FTSW-HGC-01	Solid	3/13/07 13:55	3/17/07 09:00	Customer
9678547002	FTSW-AA90MM2-02	Solid	3/13/07 15:00	3/17/07 09:00	Customer
9678547003	FTSW-AA1-03	Solid	3/13/07 16:05	3/17/07 09:00	Customer
9678547004	FTSW-AA-03D	Solid	3/13/07 16:05	3/17/07 09:00	Customer
9678547005	FTSW-AA-04	Solid	3/13/07 16:20	3/17/07 09:00	Customer
9678547006	FTSW-AA1-05	Solid	3/13/07 16:45	3/17/07 09:00	Customer
9678547007	FTSW-AA1-06	Solid	3/13/07 17:00	3/17/07 09:00	Customer
9678547008	FTSW-SA1-07	Solid	3/14/07 14:10	3/17/07 09:00	Customer
9678547009	FTSW-SA1-08	Solid	3/14/07 14:50	3/17/07 09:00	Customer
9678547010	FTSW-SA1-09	Solid	3/14/07 15:45	3/17/07 09:00	Customer
9678547011	FTSW-SA1-10	Solid	3/14/07 16:05	3/17/07 09:00	Customer
9678547012	FTSW-SA3-SW01	Water	3/14/07 17:15	3/17/07 09:00	Customer
9678547013	FTSW-SA3-SW02	Water	3/14/07 17:25	3/17/07 09:00	Customer
9678547014	FTSW-HRT-11	Solid	3/15/07 12:05	3/17/07 09:00	Customer
9678547015	FTSW-SA3-13	Solid	3/15/07 18:45	3/17/07 09:00	Customer
9678547016	FTSW-SA3-14	Solid	3/15/07 18:55	3/17/07 09:00	Customer
9678547017	FTSW-SA3-12	Solid	3/15/07 18:30	3/17/07 09:00	Customer
9678547018	FTSW-SA3-12D	Solid	3/15/07 18:30	3/17/07 09:00	Customer
9678547019	FTSW-SA3-SD02	Solid	3/14/07 17:45	3/17/07 09:00	Customer
9678547020	FTSW-SA3-SD01	Solid	3/14/07 18:00	3/17/07 09:00	Customer
9678547021	FTSW-SA3-SD01-D	Solid	3/14/07 18:00	3/17/07 09:00	Customer

Workorder Comments:

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SAMPLE SUMMARY

Workorder: 9678547 FT STEWART -GA - REV 022607 Discard Date: 06/11/2007

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By

Notes

- -- Samples collected by ALSI personnel are done so in accordance with the procedures set forth in the ALSI Field Sampling Plan (20 - Field Services Sampling Plan).
- -- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
- -- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
- -- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
- -- The Chain of Custody document is included as part of this report.

Standard Acronyms/Flags

J, B	Both flags indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
U	Indicates that the analyte was Not Detected (ND)
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
RDL	Reporting Detection Limit
ND	Not Detected - indicates that the analyte was Not Detected at the RDL
Cntr	Analysis was performed using this container
RegLmt	Regulatory Limit
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
%Rec	Percent Recovery
RPD	Relative Percent Difference

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ANALYTICAL RESULTS

Workorder: 9678547 FT STEWART -GA - REV 022607

Lab ID: **9678547001** Date Collected: 3/13/2007 13:55 Matrix: Solid
Sample ID: **FTSW-HGC-01** Date Received: 3/17/2007 09:00

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr	RegLmt
EXPLOSIVES											
2-Amino-4,6-Dinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 15:33	ELC	A	
4-Amino-2,6-dinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 15:33	ELC	A	
1,3-Dinitrobenzene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 15:33	ELC	A	
2,4-Dinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 15:33	ELC	A	
2,6-Dinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 15:33	ELC	A	
HMX	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 15:33	ELC	A	
Nitrobenzene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 15:33	ELC	A	
4-Nitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 15:33	ELC	A	
2-Nitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 15:33	ELC	A	
3-Nitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 15:33	ELC	A	
RDX	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 15:33	ELC	A	
Tetryl	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 15:33	ELC	A	
1,3,5-Trinitrobenzene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 15:33	ELC	A	
2,4,6-Trinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 15:33	ELC	A	
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*	*RegLmt*
3-Nitrochlorobenzene (S)	97		%	50-150	SW846 8330A	3/24/07	ELC	3/27/07 15:33	ELC	A	
WET CHEMISTRY											
Moisture	18.6		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
Total Solids	81.4		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
METALS											
Aluminum, Total	15500		mg/kg	10	SW846 6010B	3/22/07	CMD	3/23/07 07:45	TED	A1	
Antimony, Total	0.011J		mg/kg	0.15	SW846 6020	3/23/07	CMD	3/29/07 16:52	AJB	A2	
Copper, Total	16		mg/kg	2	SW846 6010B	3/22/07	CMD	3/23/07 07:45	TED	A1	
Lead, Total	12.5		mg/kg	0.15	SW846 6020	3/23/07	CMD	3/29/07 16:52	AJB	A2	
Zinc, Total	175		mg/kg	2	SW846 6010B	3/22/07	CMD	3/23/07 07:45	TED	A1	

Sample Comments:

Raymond J. Martrano
Laboratory Manager

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ANALYTICAL RESULTS

Workorder: 9678547 FT STEWART -GA - REV 022607

Lab ID: **9678547002** Date Collected: 3/13/2007 15:00 Matrix: Solid

Sample ID: **FTSW-AA90MM2-02** Date Received: 3/17/2007 09:00

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr	RegLmt
EXPLOSIVES											
2-Amino-4,6-Dinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 16:19	ELC	A	
4-Amino-2,6-dinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 16:19	ELC	A	
1,3-Dinitrobenzene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 16:19	ELC	A	
2,4-Dinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 16:19	ELC	A	
2,6-Dinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 16:19	ELC	A	
HMX	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 16:19	ELC	A	
Nitrobenzene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 16:19	ELC	A	
4-Nitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 16:19	ELC	A	
2-Nitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 16:19	ELC	A	
3-Nitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 16:19	ELC	A	
RDX	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 16:19	ELC	A	
Tetryl	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 16:19	ELC	A	
1,3,5-Trinitrobenzene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 16:19	ELC	A	
2,4,6-Trinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 16:19	ELC	A	
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*	*RegLmt*
3-Nitrochlorobenzene (S)	98		%	50-150	SW846 8330A	3/24/07	ELC	3/27/07 16:19	ELC	A	
WET CHEMISTRY											
Moisture	39.1		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
Total Solids	60.9		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
METALS											
Aluminum, Total	3960		mg/kg	13	SW846 6010B	3/22/07	CMD	3/23/07 07:51	TED	A1	
Antimony, Total	0.0070J		mg/kg	0.20	SW846 6020	3/23/07	CMD	3/29/07 16:55	AJB	A2	
Copper, Total	1J		mg/kg	3	SW846 6010B	3/22/07	CMD	3/23/07 07:51	TED	A1	
Lead, Total	6.5		mg/kg	0.20	SW846 6020	3/23/07	CMD	3/29/07 16:55	AJB	A2	
Zinc, Total	25		mg/kg	3	SW846 6010B	3/22/07	CMD	3/23/07 07:51	TED	A1	

Sample Comments:

Raymond J. Martrano
Laboratory Manager

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ANALYTICAL RESULTS

Workorder: 9678547 FT STEWART -GA - REV 022607

Lab ID: **9678547003** Date Collected: 3/13/2007 16:05 Matrix: Solid

Sample ID: **FTSW-AA1-03** Date Received: 3/17/2007 09:00

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr	RegLmt
EXPLOSIVES											
2-Amino-4,6-Dinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 17:05	ELC	A	
4-Amino-2,6-dinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 17:05	ELC	A	
1,3-Dinitrobenzene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 17:05	ELC	A	
2,4-Dinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 17:05	ELC	A	
2,6-Dinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 17:05	ELC	A	
HMX	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 17:05	ELC	A	
Nitrobenzene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 17:05	ELC	A	
4-Nitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 17:05	ELC	A	
2-Nitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 17:05	ELC	A	
3-Nitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 17:05	ELC	A	
RDX	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 17:05	ELC	A	
Tetryl	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 17:05	ELC	A	
1,3,5-Trinitrobenzene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 17:05	ELC	A	
2,4,6-Trinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 17:05	ELC	A	
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*	*RegLmt*
3-Nitrochlorobenzene (S)	99		%	50-150	SW846 8330A	3/24/07	ELC	3/27/07 17:05	ELC	A	
WET CHEMISTRY											
Moisture	19.8		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
Total Solids	80.2		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
METALS											
Aluminum, Total	3100		mg/kg	11	SW846 6010B	3/22/07	CMD	3/23/07 07:57	TED	A1	
Antimony, Total	0.055J		mg/kg	0.19	SW846 6020	3/23/07	CMD	3/29/07 16:58	AJB	A2	
Copper, Total	1J		mg/kg	2	SW846 6010B	3/22/07	CMD	3/23/07 07:57	TED	A1	
Lead, Total	65.3		mg/kg	0.19	SW846 6020	3/23/07	CMD	3/29/07 16:58	AJB	A2	
Zinc, Total	5		mg/kg	2	SW846 6010B	3/22/07	CMD	3/23/07 07:57	TED	A1	

Sample Comments:

Raymond J. Martrano
Laboratory Manager

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ANALYTICAL RESULTS

Workorder: 9678547 FT STEWART -GA - REV 022607

Lab ID: **9678547004** Date Collected: 3/13/2007 16:05 Matrix: Solid
Sample ID: **FTSW-AA-03D** Date Received: 3/17/2007 09:00

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr	RegLmt
EXPLOSIVES											
2-Amino-4,6-Dinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 17:51	ELC	A	
4-Amino-2,6-dinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 17:51	ELC	A	
1,3-Dinitrobenzene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 17:51	ELC	A	
2,4-Dinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 17:51	ELC	A	
2,6-Dinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 17:51	ELC	A	
HMX	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 17:51	ELC	A	
Nitrobenzene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 17:51	ELC	A	
4-Nitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 17:51	ELC	A	
2-Nitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 17:51	ELC	A	
3-Nitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 17:51	ELC	A	
RDX	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 17:51	ELC	A	
Tetryl	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 17:51	ELC	A	
1,3,5-Trinitrobenzene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 17:51	ELC	A	
2,4,6-Trinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 17:51	ELC	A	
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*	*RegLmt*
3-Nitrochlorobenzene (S)	102		%	50-150	SW846 8330A	3/24/07	ELC	3/27/07 17:51	ELC	A	
WET CHEMISTRY											
Moisture	20.9		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
Total Solids	79.1		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
METALS											
Aluminum, Total	3010		mg/kg	8	SW846 6010B	3/22/07	CMD	3/23/07 08:13	TED	A1	
Antimony, Total	0.030J		mg/kg	0.23	SW846 6020	3/23/07	CMD	3/29/07 17:00	AJB	A2	
Copper, Total	1J		mg/kg	2	SW846 6010B	3/22/07	CMD	3/23/07 08:13	TED	A1	
Lead, Total	67.7		mg/kg	0.23	SW846 6020	3/23/07	CMD	3/29/07 17:00	AJB	A2	
Zinc, Total	5		mg/kg	2	SW846 6010B	3/22/07	CMD	3/23/07 08:13	TED	A1	

Sample Comments:

Raymond J. Martrano
Laboratory Manager

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ANALYTICAL RESULTS

Workorder: 9678547 FT STEWART -GA - REV 022607

Lab ID: **9678547005** Date Collected: 3/13/2007 16:20 Matrix: Solid
Sample ID: **FTSW-AA-04** Date Received: 3/17/2007 09:00

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr	RegLmt
EXPLOSIVES											
2-Amino-4,6-Dinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 18:37	ELC	A	
4-Amino-2,6-dinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 18:37	ELC	A	
1,3-Dinitrobenzene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 18:37	ELC	A	
2,4-Dinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 18:37	ELC	A	
2,6-Dinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 18:37	ELC	A	
HMX	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 18:37	ELC	A	
Nitrobenzene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 18:37	ELC	A	
4-Nitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 18:37	ELC	A	
2-Nitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 18:37	ELC	A	
3-Nitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 18:37	ELC	A	
RDX	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 18:37	ELC	A	
Tetryl	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 18:37	ELC	A	
1,3,5-Trinitrobenzene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 18:37	ELC	A	
2,4,6-Trinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 18:37	ELC	A	
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*	*RegLmt*
3-Nitrochlorobenzene (S)	100		%	50-150	SW846 8330A	3/24/07	ELC	3/27/07 18:37	ELC	A	
WET CHEMISTRY											
Moisture	3.5		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
Total Solids	96.5		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
METALS											
Aluminum, Total	2700		mg/kg	8	SW846 6010B	3/22/07	CMD	3/23/07 08:19	TED	A1	
Antimony, Total	0.20	1	mg/kg	0.12	SW846 6020	3/23/07	CMD	3/29/07 17:03	AJB	A2	
Copper, Total	2J		mg/kg	2	SW846 6010B	3/22/07	CMD	3/23/07 08:19	TED	A1	
Lead, Total	19.8	1,2	mg/kg	0.12	SW846 6020	3/23/07	CMD	3/29/07 17:03	AJB	A2	
Zinc, Total	12		mg/kg	2	SW846 6010B	3/22/07	CMD	3/23/07 08:19	TED	A1	

Sample Comments:

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ANALYTICAL RESULTS

Workorder: 9678547 FT STEWART -GA - REV 022607

Lab ID: **9678547006** Date Collected: 3/13/2007 16:45 Matrix: Solid

Sample ID: **FTSW-AA1-05** Date Received: 3/17/2007 09:00

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr	RegLmt
EXPLOSIVES											
2-Amino-4,6-Dinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 20:55	ELC	A	
4-Amino-2,6-dinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 20:55	ELC	A	
1,3-Dinitrobenzene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 20:55	ELC	A	
2,4-Dinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 20:55	ELC	A	
2,6-Dinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 20:55	ELC	A	
HMX	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 20:55	ELC	A	
Nitrobenzene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 20:55	ELC	A	
4-Nitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 20:55	ELC	A	
2-Nitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 20:55	ELC	A	
3-Nitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 20:55	ELC	A	
RDX	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 20:55	ELC	A	
Tetryl	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 20:55	ELC	A	
1,3,5-Trinitrobenzene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 20:55	ELC	A	
2,4,6-Trinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 20:55	ELC	A	
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*	*RegLmt*
3-Nitrochlorobenzene (S)	100		%	50-150	SW846 8330A	3/24/07	ELC	3/27/07 20:55	ELC	A	
WET CHEMISTRY											
Moisture	27.6		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
Total Solids	72.4		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
METALS											
Aluminum, Total	4790		mg/kg	13	SW846 6010B	3/22/07	CMD	3/23/07 08:36	TED	A1	
Antimony, Total	0.074J		mg/kg	0.26	SW846 6020	3/23/07	CMD	3/29/07 17:23	AJB	A2	
Copper, Total	2J		mg/kg	3	SW846 6010B	3/22/07	CMD	3/23/07 08:36	TED	A1	
Lead, Total	4.8		mg/kg	0.26	SW846 6020	3/23/07	CMD	3/29/07 17:23	AJB	A2	
Zinc, Total	9		mg/kg	3	SW846 6010B	3/22/07	CMD	3/23/07 08:36	TED	A1	

Sample Comments:

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ANALYTICAL RESULTS

Workorder: 9678547 FT STEWART -GA - REV 022607

Lab ID: **9678547007** Date Collected: 3/13/2007 17:00 Matrix: Solid
Sample ID: **FTSW-AA1-06** Date Received: 3/17/2007 09:00

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr	RegLmt
EXPLOSIVES											
2-Amino-4,6-Dinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 21:41	ELC	A	
4-Amino-2,6-dinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 21:41	ELC	A	
1,3-Dinitrobenzene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 21:41	ELC	A	
2,4-Dinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 21:41	ELC	A	
2,6-Dinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 21:41	ELC	A	
HMX	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 21:41	ELC	A	
Nitrobenzene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 21:41	ELC	A	
4-Nitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 21:41	ELC	A	
2-Nitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 21:41	ELC	A	
3-Nitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 21:41	ELC	A	
RDX	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 21:41	ELC	A	
Tetryl	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 21:41	ELC	A	
1,3,5-Trinitrobenzene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 21:41	ELC	A	
2,4,6-Trinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 21:41	ELC	A	
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*	*RegLmt*
3-Nitrochlorobenzene (S)	104		%	50-150	SW846 8330A	3/24/07	ELC	3/27/07 21:41	ELC	A	
WET CHEMISTRY											
Moisture	5.4		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
Total Solids	94.6		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
METALS											
Aluminum, Total	7830		mg/kg	11	SW846 6010B	3/22/07	CMD	3/23/07 08:42	TED	A1	
Antimony, Total	0.016J		mg/kg	0.17	SW846 6020	3/23/07	CMD	3/29/07 17:26	AJB	A2	
Copper, Total	0.8J		mg/kg	2	SW846 6010B	3/22/07	CMD	3/23/07 08:42	TED	A1	
Lead, Total	4.4		mg/kg	0.17	SW846 6020	3/23/07	CMD	3/29/07 17:26	AJB	A2	
Zinc, Total	4		mg/kg	2	SW846 6010B	3/22/07	CMD	3/23/07 08:42	TED	A1	

Sample Comments:

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ANALYTICAL RESULTS

Workorder: 9678547 FT STEWART -GA - REV 022607

Lab ID:	**9678547008**	Date Collected:	3/14/2007 14:10	Matrix:	Solid
Sample ID:	**FTSW-SA1-07**	Date Received:	3/17/2007 09:00		

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr	RegLmt
WET CHEMISTRY											
Moisture	35.4		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
Total Solids	64.6		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
METALS											
Antimony, Total	0.056J		mg/kg	0.31	SW846 6020	3/23/07	CMD	3/29/07 17:29	AJB	A2	
Copper, Total	2J		mg/kg	3	SW846 6010B	3/22/07	CMD	3/23/07 08:48	TED	A1	
Lead, Total	6.8		mg/kg	0.31	SW846 6020	3/23/07	CMD	3/29/07 17:29	AJB	A2	

Sample Comments:

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ANALYTICAL RESULTS

Workorder: 9678547 FT STEWART -GA - REV 022607

Lab ID:	**9678547009**	Date Collected:	3/14/2007 14:50	Matrix:	Solid
Sample ID:	**FTSW-SA1-08**	Date Received:	3/17/2007 09:00		

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr	RegLmt
WET CHEMISTRY											
Moisture	12.1		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
Total Solids	87.9		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
METALS											
Antimony, Total	0.010J		mg/kg	0.21	SW846 6020	3/23/07	CMD	3/29/07 17:32	AJB	A2	
Copper, Total	6		mg/kg	2	SW846 6010B	3/22/07	CMD	3/23/07 08:54	TED	A1	
Lead, Total	6.1		mg/kg	0.21	SW846 6020	3/23/07	CMD	3/29/07 17:32	AJB	A2	

Sample Comments:

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ANALYTICAL RESULTS

Workorder: 9678547 FT STEWART -GA - REV 022607

Lab ID: **9678547010** Date Collected: 3/14/2007 15:45 Matrix: Solid
Sample ID: **FTSW-SA1-09** Date Received: 3/17/2007 09:00

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr	RegLmt
WET CHEMISTRY											
Moisture	30.4		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
Total Solids	69.6		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
METALS											
Antimony, Total	0.019J		mg/kg	0.28	SW846 6020	3/23/07	CMD	3/29/07 17:35	AJB	A1	
Copper, Total	0.8J		mg/kg	3	SW846 6010B	3/26/07	CMD	3/28/07 12:13	JWK	A2	
Lead, Total	5.2		mg/kg	0.28	SW846 6020	3/23/07	CMD	3/29/07 17:35	AJB	A1	

Sample Comments:

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ANALYTICAL RESULTS

Workorder: 9678547 FT STEWART -GA - REV 022607

Lab ID: **9678547011** Date Collected: 3/14/2007 16:05 Matrix: Solid

Sample ID: **FTSW-SA1-10** Date Received: 3/17/2007 09:00

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr	RegLmt
WET CHEMISTRY											
Moisture	32.6		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
Total Solids	67.4		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
METALS											
Antimony, Total	0.017J		mg/kg	0.26	SW846 6020	3/23/07	CMD	3/29/07 17:38	AJB	A1	
Copper, Total	1J		mg/kg	3	SW846 6010B	3/26/07	CMD	3/28/07 12:19	JWK	A2	
Lead, Total	7.9		mg/kg	0.26	SW846 6020	3/23/07	CMD	3/29/07 17:38	AJB	A1	

Sample Comments:

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ANALYTICAL RESULTS

Workorder: 9678547 FT STEWART -GA - REV 022607

Lab ID: **9678547012** Date Collected: 3/14/2007 17:15 Matrix: Water
Sample ID: **FTSW-SA3-SW01** Date Received: 3/17/2007 09:00

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr	RegLmt
METALS											
Antimony, Total	ND		mg/L	0.0020	SW846 6020	3/22/07	CMD	3/29/07 10:56	AJB	A2	
Copper, Total	0.005J		mg/L	0.011	SW846 6010B	3/22/07	CMD	3/26/07 13:11	JWK	A1	
Lead, Total	0.0003J		mg/L	0.0020	SW846 6020	3/22/07	CMD	3/29/07 10:56	AJB	A2	

Sample Comments:

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ANALYTICAL RESULTS

Workorder: 9678547 FT STEWART -GA - REV 022607

Lab ID: **9678547013** Date Collected: 3/14/2007 17:25 Matrix: Water

Sample ID: **FTSW-SA3-SW02** Date Received: 3/17/2007 09:00

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr	RegLmt
METALS											
Antimony, Total	ND		mg/L	0.0020	SW846 6020	3/22/07	CMD	3/29/07 11:01	AJB	A2	
Copper, Total	0.005J		mg/L	0.011	SW846 6010B	3/22/07	CMD	3/26/07 13:15	JWK	A1	
Lead, Total	0.0008J		mg/L	0.0020	SW846 6020	3/22/07	CMD	3/29/07 11:01	AJB	A2	

Sample Comments:

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ANALYTICAL RESULTS

Workorder: 9678547 FT STEWART -GA - REV 022607

Lab ID:	**9678547014**	Date Collected:	3/15/2007 12:05	Matrix:	Solid
Sample ID:	**FTSW-HRT-11**	Date Received:	3/17/2007 09:00		

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr	RegLmt
EXPLOSIVES											
2-Amino-4,6-Dinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 22:27	ELC	A	
4-Amino-2,6-dinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 22:27	ELC	A	
1,3-Dinitrobenzene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 22:27	ELC	A	
2,4-Dinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 22:27	ELC	A	
2,6-Dinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 22:27	ELC	A	
HMX	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 22:27	ELC	A	
Nitrobenzene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 22:27	ELC	A	
4-Nitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 22:27	ELC	A	
2-Nitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 22:27	ELC	A	
3-Nitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 22:27	ELC	A	
RDX	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 22:27	ELC	A	
Tetryl	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 22:27	ELC	A	
1,3,5-Trinitrobenzene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 22:27	ELC	A	
2,4,6-Trinitrotoluene	ND		mg/kg	0.25	SW846 8330A	3/24/07	ELC	3/27/07 22:27	ELC	A	
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*	*RegLmt*
3-Nitrochlorobenzene (S)	109		%	50-150	SW846 8330A	3/24/07	ELC	3/27/07 22:27	ELC	A	
WET CHEMISTRY											
Moisture	23.8		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
Total Solids	76.2		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
METALS											
Aluminum, Total	1390		mg/kg	11	SW846 6010B	3/26/07	CMD	3/28/07 12:25	JWK	A2	
Antimony, Total	0.83		mg/kg	0.26	SW846 6020	3/23/07	CMD	3/29/07 17:40	AJB	A1	
Copper, Total	1J		mg/kg	2	SW846 6010B	3/26/07	CMD	3/28/07 12:25	JWK	A2	
Lead, Total	25.8		mg/kg	0.26	SW846 6020	3/23/07	CMD	3/29/07 17:40	AJB	A1	
Zinc, Total	2J		mg/kg	2	SW846 6010B	3/26/07	CMD	3/28/07 12:25	JWK	A2	

Sample Comments:

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ANALYTICAL RESULTS

Workorder: 9678547 FT STEWART -GA - REV 022607

Lab ID: **9678547015** Date Collected: 3/15/2007 18:45 Matrix: Solid
Sample ID: **FTSW-SA3-13** Date Received: 3/17/2007 09:00

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr	RegLmt
WET CHEMISTRY											
Moisture	26.7		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
Total Solids	73.3		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
METALS											
Antimony, Total	0.026J		mg/kg	0.21	SW846 6020	3/23/07	CMD	3/29/07 17:49	AJB	A1	
Copper, Total	1J		mg/kg	2	SW846 6010B	3/26/07	CMD	3/28/07 12:31	JWK	A2	
Lead, Total	8.6		mg/kg	0.21	SW846 6020	3/23/07	CMD	3/29/07 17:49	AJB	A1	

Sample Comments:

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ANALYTICAL RESULTS

Workorder: 9678547 FT STEWART -GA - REV 022607

Lab ID: **9678547016** Date Collected: 3/15/2007 18:55 Matrix: Solid

Sample ID: **FTSW-SA3-14** Date Received: 3/17/2007 09:00

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr	RegLmt
WET CHEMISTRY											
Moisture	31.2		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
Total Solids	68.8		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
METALS											
Antimony, Total	0.017J	1	mg/kg	0.15	SW846 6020	4/2/07	CMD	4/4/07 16:40	AJB	A3	
Copper, Total	0.8J		mg/kg	2	SW846 6010B	3/26/07	CMD	3/28/07 12:37	JWK	A2	
Lead, Total	4.6		mg/kg	0.15	SW846 6020	4/2/07	CMD	4/5/07 03:08	AJB	A3	

Sample Comments:

Raymond J. Martrano
Laboratory Manager

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ANALYTICAL RESULTS

Workorder: 9678547 FT STEWART -GA - REV 022607

Lab ID:	**9678547017**	Date Collected:	3/15/2007 18:30	Matrix:	Solid
Sample ID:	**FTSW-SA3-12**	Date Received:	3/17/2007 09:00		

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr	RegLmt
WET CHEMISTRY											
Moisture	27.9		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
Total Solids	72.1		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
METALS											
Antimony, Total	0.072J		mg/kg	0.24	SW846 6020	3/23/07	CMD	3/29/07 18:06	AJB	A1	
Copper, Total	1J		mg/kg	3	SW846 6010B	3/26/07	CMD	3/28/07 13:23	JWK	A2	
Lead, Total	6.7		mg/kg	0.24	SW846 6020	3/23/07	CMD	3/29/07 18:06	AJB	A1	

Sample Comments:

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ANALYTICAL RESULTS

Workorder: 9678547 FT STEWART -GA - REV 022607

Lab ID:	**9678547018**	Date Collected:	3/15/2007 18:30	Matrix:	Solid
Sample ID:	**FTSW-SA3-12D**	Date Received:	3/17/2007 09:00		

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr	RegLmt
WET CHEMISTRY											
Moisture	28.1		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
Total Solids	71.9		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
METALS											
Antimony, Total	0.039J		mg/kg	0.19	SW846 6020	3/23/07	CMD	3/29/07 18:09	AJB	A1	
Copper, Total	1J		mg/kg	2	SW846 6010B	3/26/07	CMD	3/28/07 13:29	JWK	A2	
Lead, Total	6.6		mg/kg	0.19	SW846 6020	3/23/07	CMD	3/29/07 18:09	AJB	A1	

Sample Comments:

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ANALYTICAL RESULTS

Workorder: 9678547 FT STEWART -GA - REV 022607

Lab ID: **9678547019** Date Collected: 3/14/2007 17:45 Matrix: Solid
Sample ID: **FTSW-SA3-SD02** Date Received: 3/17/2007 09:00

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr	RegLmt
WET CHEMISTRY											
Moisture	23.5		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
Total Solids	76.5		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
METALS											
Antimony, Total	0.017J	1	mg/kg	0.24	SW846 6020	3/26/07	CMD	3/29/07 18:26	AJB	A2	
Copper, Total	2J		mg/kg	2	SW846 6010B	3/26/07	CMD	3/28/07 13:35	JWK	A1	
Lead, Total	5.4		mg/kg	0.24	SW846 6020	3/26/07	CMD	3/29/07 18:26	AJB	A2	

Sample Comments:

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ANALYTICAL RESULTS

Workorder: 9678547 FT STEWART -GA - REV 022607

Lab ID: **9678547020** Date Collected: 3/14/2007 18:00 Matrix: Solid

Sample ID: **FTSW-SA3-SD01** Date Received: 3/17/2007 09:00

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr	RegLmt
WET CHEMISTRY											
Moisture	16.7		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
Total Solids	83.3		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
METALS											
Antimony, Total	0.084J		mg/kg	0.19	SW846 6020	3/23/07	CMD	3/29/07 18:12	AJB	A1	
Copper, Total	0.4J		mg/kg	2	SW846 6010B	3/26/07	CMD	3/28/07 13:52	JWK	A2	
Lead, Total	1.4		mg/kg	0.19	SW846 6020	3/23/07	CMD	3/29/07 18:12	AJB	A1	

Sample Comments:

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ANALYTICAL RESULTS

Workorder: 9678547 FT STEWART -GA - REV 022607

Lab ID: **9678547021** Date Collected: 3/14/2007 18:00 Matrix: Solid
Sample ID: **FTSW-SA3-SD01-D** Date Received: 3/17/2007 09:00

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr	RegLmt
WET CHEMISTRY											
Moisture	16.1		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
Total Solids	83.9		%	0.1	SM20-2540 G			3/19/07 21:00	MWO	A	
METALS											
Antimony, Total	0.032J		mg/kg	0.20	SW846 6020	3/26/07	CMD	3/29/07 18:40	AJB	A2	
Copper, Total	0.4J		mg/kg	2	SW846 6010B	3/26/07	CMD	3/28/07 13:58	JWK	A1	
Lead, Total	1.1		mg/kg	0.20	SW846 6020	3/26/07	CMD	3/29/07 18:40	AJB	A2	

Sample Comments:

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ANALYTICAL RESULTS QUALIFIERS\FLAGS

Workorder: 9678547 FT STEWART -GA - REV 022607

PARAMETER QUALIFIERS\FLAGS

[1] The recovery of the Matrix Spike (MS) associated to this analyte was outside of the established control limits. The sample was post-digestion spiked, and this matrix spike was within acceptable recovery limits.

[2] One of the two matrix spike analyses performed on this sample failed to meet acceptable recovery limits. The other matrix spike was within acceptable recovery limits. Matrix interferences are the possible cause for the failure.

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QUALITY CONTROL DATA

Workorder: 9678547 FT STEWART -GA - REV 022607

QC Batch: HPLC/1766 Analysis Method: SW846 8330A

QC Batch Method: SW846 8330A

Associated Lab Samples: 9678547001 9678547002 9678547003 9678547004 9678547005 9678547006 9678547007 9678547014

METHOD BLANK: 349700

Parameter	Result	Qualifiers	Units	Reporting Limit
2-Amino-4,6-Dinitrotoluene	ND		ug/kg	250
4-Amino-2,6-dinitrotoluene	ND		ug/kg	250
1,3-Dinitrobenzene	ND		ug/kg	250
2,4-Dinitrotoluene	ND		ug/kg	250
2,6-Dinitrotoluene	ND		ug/kg	250
HMX	ND		ug/kg	250
Nitrobenzene	ND		ug/kg	250
4-Nitrotoluene	ND		ug/kg	250
2-Nitrotoluene	ND		ug/kg	250
3-Nitrotoluene	ND		ug/kg	250
RDX	ND		ug/kg	250
Tetryl	ND		ug/kg	250
1,3,5-Trinitrobenzene	ND		ug/kg	250
2,4,6-Trinitrotoluene	ND		ug/kg	250
Surrogate Recoveries				
3-Nitrochlorobenzene	99		%	50-150

LABORATORY CONTROL SAMPLE: 349701

Parameter	LCS Result	Qualifiers	Units	Spike Conc.	LCS % Rec	% Rec Limits
2-Amino-4,6-Dinitrotoluene	840		ug/kg	1000	84	70-130
4-Amino-2,6-dinitrotoluene	826		ug/kg	1000	83	70-130
1,3-Dinitrobenzene	868		ug/kg	1000	87	70-130
2,4-Dinitrotoluene	747		ug/kg	1000	75	70-130
2,6-Dinitrotoluene	818		ug/kg	1000	82	70-130
HMX	794		ug/kg	1000	79	70-130
Nitrobenzene	860		ug/kg	1000	86	70-130
4-Nitrotoluene	900		ug/kg	1000	90	70-130
2-Nitrotoluene	889		ug/kg	1000	89	70-130
3-Nitrotoluene	883		ug/kg	1000	88	70-130
RDX	872		ug/kg	1000	87	70-130
Tetryl	433		ug/kg	1000	43	70-130
1,3,5-Trinitrobenzene	700		ug/kg	1000	70	70-130
2,4,6-Trinitrotoluene	822		ug/kg	1000	82	70-130
Surrogate Recoveries						
3-Nitrochlorobenzene			%		98	50-150

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QUALITY CONTROL DATA

Workorder: 9678547 FT STEWART -GA - REV 022607

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 349702 349703 Original: 9678547005

***NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Qualifiers	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
2-Amino-4,6-Dinitrotoluene	0		ug/kg	952	781	877	82	86	70-130	4.8	50
4-Amino-2,6-dinitrotoluene	0		ug/kg	952	704	792	74	78	70-130	5.3	50
1,3-Dinitrobenzene	0		ug/kg	952	828	918	87	90	70-130	3.4	50
2,4-Dinitrotoluene	0		ug/kg	952	733	825	77	81	70-130	5.1	50
2,6-Dinitrotoluene	0		ug/kg	952	818	913	86	90	70-130	4.5	50
HMX	0		ug/kg	952	754	831	79	82	70-130	3.7	50
Nitrobenzene	0		ug/kg	952	788	883	83	87	70-130	4.7	50
4-Nitrotoluene	0		ug/kg	952	892	1040	94	103	70-130	9.1	50
2-Nitrotoluene	0		ug/kg	952	875	935	92	92	70-130	0	50
3-Nitrotoluene	0		ug/kg	952	833	995	87	98	70-130	12	50
RDX	0		ug/kg	952	835	866	88	85	70-130	3.5	50
Tetryl	0		ug/kg	952	689	749	72	74	20-175	2.7	50
1,3,5-Trinitrobenzene	0		ug/kg	952	750	820	79	81	70-130	2.5	50
2,4,6-Trinitrotoluene	0		ug/kg	952	768	848	81	84	70-130	3.6	50
Surrogate Recoveries											
3-Nitrochlorobenzene	100		%				99	102	50-150	3	

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QUALITY CONTROL DATA

Workorder: 9678547 FT STEWART -GA - REV 022607

QC Batch: MDIG/14329 Analysis Method: SW846 6010B

QC Batch Method: SW846 3050

Associated Lab Samples: 9678547001 9678547002 9678547003 9678547004 9678547005 9678547006 9678547007 9678547008 9678547009

METHOD BLANK: 350298

Parameter	Result	Qualifiers	Units	Reporting Limit
Aluminum, Total	ND		mg/kg	10
Copper, Total	ND		mg/kg	2
Zinc, Total	ND		mg/kg	2

LABORATORY CONTROL SAMPLE: 350299

Parameter	LCS Result	Qualifiers	Units	Spike Conc.	LCS % Rec	% Rec Limits
Aluminum, Total	115		mg/kg	100	115	80-120
Copper, Total	107		mg/kg	100	107	80-120
Zinc, Total	112		mg/kg	100	112	80-120

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 350300 350301 Original: 9678547005

****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Qualifiers	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Aluminum, Total	2610	3	mg/kg	81	3040	2900	396	232	75-125	52	25
Copper, Total	2		mg/kg	81	92	92	108	107	75-125	0.9	25
Zinc, Total	12		mg/kg	81	107	105	112	110	75-125	1.8	25

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QUALITY CONTROL DATA

Workorder: 9678547 FT STEWART -GA - REV 022607

QC Batch: MDIG/14334 Analysis Method: SW846 6010B
QC Batch Method: SW846 3015
Associated Lab Samples: 9678547012 9678547013

METHOD BLANK: 350318

Parameter	Result	Qualifiers	Units	Reporting Limit
Copper, Total	0.002J		mg/L	0.011

LABORATORY CONTROL SAMPLE: 350319

Parameter	LCS Result	Qualifiers	Units	Spike Conc.	LCS % Rec	% Rec Limits
Copper, Total	1.07		mg/L	1.11	96	80-120

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 350320 350321 Original: 9678547013

****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Qualifiers	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Copper, Total	0.005		mg/L	1.11	1.10	1.12	99	101	75-125	2	20

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QUALITY CONTROL DATA

Workorder: 9678547 FT STEWART -GA - REV 022607

QC Batch: MDIG/14335 Analysis Method: SW846 6020

QC Batch Method: SW846 3015

Associated Lab Samples: 9678547012 9678547013

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 350324 350325 Original: 9678547013

*****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.*

Parameter	Original Result	Qualifiers	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Antimony, Total	3e-005		mg/L	0.111	0.110	0.110	99	99	75-125	0	20
Lead, Total	0.0008		mg/L	0.111	0.109	0.114	98	102	75-125	4	20

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QUALITY CONTROL DATA

Workorder: 9678547 FT STEWART -GA - REV 022607

QC Batch: MDIG/14345 Analysis Method: SW846 6020

QC Batch Method: SW846 3050

Associated Lab Samples: 9678547001 9678547002 9678547003 9678547004 9678547005 9678547006 9678547007 9678547008 9678547009 9678547010 9678547011 9678547014 9678547015 9678547017 9678547018 9678547020

METHOD BLANK: 350677

Parameter	Result	Qualifiers	Units	Reporting Limit
Antimony, Total	0.0063J		mg/kg	0.20
Lead, Total	0.017J		mg/kg	0.20

LABORATORY CONTROL SAMPLE: 350678

Parameter	LCS Result	Qualifiers	Units	Spike Conc.	LCS % Rec	% Rec Limits
Antimony, Total	9.5		mg/kg	10	95	80-120
Lead, Total	10.4		mg/kg	10	104	80-120

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 350679 350680 Original: 9678547005

****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.*

Parameter	Original Result	Qualifiers	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Antimony, Total	0.19		mg/kg	5.9	0.99	1.7	13	24	75-125	59	20
Lead, Total	19.1		mg/kg	5.9	81.5	25.3	1010	88	75-125	168	20

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QUALITY CONTROL DATA

Workorder: 9678547 FT STEWART -GA - REV 022607

QC Batch: MDIG/14355 Analysis Method: SW846 6010B

QC Batch Method: SW846 3050

Associated Lab Samples: 9678547010 9678547011 9678547014 9678547015 9678547016 9678547017 9678547018 9678547019 9678547020 9678547021

METHOD BLANK: 351058

Parameter	Result	Qualifiers	Units	Reporting Limit
Aluminum, Total	ND		mg/kg	10
Copper, Total	0.6J		mg/kg	2
Zinc, Total	ND		mg/kg	2

LABORATORY CONTROL SAMPLE: 351059

Parameter	LCS Result	Qualifiers	Units	Spike Conc.	LCS % Rec	% Rec Limits
Aluminum, Total	115		mg/kg	100	115	80-120
Copper, Total	104		mg/kg	100	104	80-120
Zinc, Total	114		mg/kg	100	114	80-120

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 351060 351061 Original: 9678547016

****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Qualifiers	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Aluminum, Total			mg/kg		1000	1130					
Copper, Total	0.5		mg/kg	57	88	88	106	105	75-125	0.9	25
Zinc, Total			mg/kg		99	98					

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 351062 351063 Original: 9678547019

****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Qualifiers	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Aluminum, Total			mg/kg		2390	1840					
Copper, Total	1		mg/kg	80	110	110	104	104	75-125	0	25
Zinc, Total			mg/kg		124	123					

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QUALITY CONTROL DATA

Workorder: 9678547 FT STEWART -GA - REV 022607

QC Batch: MDIG/14356 Analysis Method: SW846 6020

QC Batch Method: SW846 3050

Associated Lab Samples: 9678547019 9678547021

METHOD BLANK: 351064

Parameter	Result	Qualifiers	Units	Reporting Limit
Antimony, Total	ND		mg/kg	0.20
Lead, Total	0.024J		mg/kg	0.20

LABORATORY CONTROL SAMPLE: 351065

Parameter	LCS Result	Qualifiers	Units	Spike Conc.	LCS % Rec	% Rec Limits
Antimony, Total	9.6		mg/kg	10	96	80-120
Lead, Total	9.3		mg/kg	10	93	80-120

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 351066 351067 Original: 9678547019

****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Qualifiers	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Antimony, Total	0.013		mg/kg	9.3	2.1	2.4	18	20	75-125	11	20
Lead, Total	4.1		mg/kg	9.3	15.7	15.8	86	88	75-125	2.3	20

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QUALITY CONTROL DATA

Workorder: 9678547 FT STEWART -GA - REV 022607

QC Batch: MDIG/14429 Analysis Method: SW846 6020

QC Batch Method: SW846 3050

Associated Lab Samples:						
	9678547016	9679276001	9679276002	9679276003	9679276004	9679276005
	9679276006	9679276007	9679276008	9679276009	9679276010	9679276011

METHOD BLANK: 352808

Parameter	Result	Qualifiers	Units	Reporting Limit
Antimony, Total	0.023J		mg/kg	0.20

METHOD BLANK: 352808

Parameter	Result	Qualifiers	Units	Reporting Limit
Lead, Total	0.0077J		mg/kg	0.20

LABORATORY CONTROL SAMPLE: 352809

Parameter	LCS Result	Qualifiers	Units	Spike Conc.	LCS % Rec	% Rec Limits
Antimony, Total	9.6		mg/kg	10	96	80-120

LABORATORY CONTROL SAMPLE: 352809

Parameter	LCS Result	Qualifiers	Units	Spike Conc.	LCS % Rec	% Rec Limits
Lead, Total	9.6		mg/kg	10	96	80-120

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 352810 352811 Original: 9678547016

****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Qualifiers	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Antimony, Total	0.012		mg/kg	5.2	2.8	2.9	36	39	75-125	8	20

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 352810 352811 Original: 9678547016

****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Qualifiers	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Lead, Total	3.2		mg/kg	5.2	12.5	12.4	103	104	75-125	1	20

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Enviromental ♦ Industrial Hygiene
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www.analyticallab.com

QUALITY CONTROL DATA

Workorder: 9678547 FT STEWART -GA - REV 022607

QC Batch: WETC/40012 Analysis Method: SM20-2540 G

QC Batch Method: SM20-2540 G

Associated Lab Samples:

9678547001	9678547002	9678547003	9678547004	9678547005	9678547006
9678547007	9678547008	9678547009	9678547010	9678547011	9678547014
9678547015	9678547016	9678547017	9678547018	9678547019	9678547020
9678547021					

SAMPLE DUPLICATE: 349371 Original: 9678542001

****NOTE - The Original Result and Duplicate Result shown below are raw results and are only used for the purpose of calculating Sample Duplicate percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Qualifiers	Units	DUP Result	RPD	Max RPD
Moisture	14.9		%	14.5	2.7	10
Total Solids	85.1		%	85.5	0.5	5

SAMPLE DUPLICATE: 349372 Original: 9678542011

****NOTE - The Original Result and Duplicate Result shown below are raw results and are only used for the purpose of calculating Sample Duplicate percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Qualifiers	Units	DUP Result	RPD	Max RPD
Moisture	12.3		%	12.0	2.5	10
Total Solids	87.7		%	88.0	0.3	5

SAMPLE DUPLICATE: 349376 Original: 9678547016

****NOTE - The Original Result and Duplicate Result shown below are raw results and are only used for the purpose of calculating Sample Duplicate percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Qualifiers	Units	DUP Result	RPD	Max RPD
Moisture	31.2		%	32.0	2.5	10
Total Solids	68.8		%	68.0	1.2	5

SAMPLE DUPLICATE: 349377 Original: 9678547005

****NOTE - The Original Result and Duplicate Result shown below are raw results and are only used for the purpose of calculating Sample Duplicate percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Qualifiers	Units	DUP Result	RPD	Max RPD
Moisture	3.5		%	3.5	0	10
Total Solids	96.5		%	96.5	0	5

SAMPLE DUPLICATE: 349378 Original: 9678547019

****NOTE - The Original Result and Duplicate Result shown below are raw results and are only used for the purpose of calculating Sample Duplicate percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Qualifiers	Units	DUP Result	RPD	Max RPD
Moisture	23.5		%	25.6	8.6	10
Total Solids	76.5		%	74.4	2.8	5

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QUALITY CONTROL DATA QUALIFIERS\FLAGS

Workorder: 9678547 FT STEWART -GA - REV 022607

QUALITY CONTROL PARAMETER QUALIFIERS

[3] The concentration of this analyte was greater than ten times the concentration of the spike added to the matrix spike. According to protocol, the calculation for percent recovery of the matrix spike is not valid.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 9678547 FT STEWART -GA - REV 022607

Lab ID	Sample ID	Prep Batch Method	Prep Batch	Analytical Method	Analytical Batch
9678547001	**FTSW-HGC-01**	SW846 8330A	HPLC/1766	SW846 8330A	HPLC/1773
9678547002	**FTSW-AA90MM2-02**	SW846 8330A	HPLC/1766	SW846 8330A	HPLC/1773
9678547003	**FTSW-AA1-03**	SW846 8330A	HPLC/1766	SW846 8330A	HPLC/1773
9678547004	**FTSW-AA-03D**	SW846 8330A	HPLC/1766	SW846 8330A	HPLC/1773
9678547005	**FTSW-AA-04**	SW846 8330A	HPLC/1766	SW846 8330A	HPLC/1773
9678547006	**FTSW-AA1-05**	SW846 8330A	HPLC/1766	SW846 8330A	HPLC/1773
9678547007	**FTSW-AA1-06**	SW846 8330A	HPLC/1766	SW846 8330A	HPLC/1773
9678547014	**FTSW-HRT-11**	SW846 8330A	HPLC/1766	SW846 8330A	HPLC/1773
9678547001	**FTSW-HGC-01**	SW846 3050	MDIG/14329	SW846 6010B	META/16178
9678547002	**FTSW-AA90MM2-02**	SW846 3050	MDIG/14329	SW846 6010B	META/16178
9678547003	**FTSW-AA1-03**	SW846 3050	MDIG/14329	SW846 6010B	META/16178
9678547004	**FTSW-AA-03D**	SW846 3050	MDIG/14329	SW846 6010B	META/16178
9678547005	**FTSW-AA-04**	SW846 3050	MDIG/14329	SW846 6010B	META/16178
9678547006	**FTSW-AA1-05**	SW846 3050	MDIG/14329	SW846 6010B	META/16178
9678547007	**FTSW-AA1-06**	SW846 3050	MDIG/14329	SW846 6010B	META/16178
9678547008	**FTSW-SA1-07**	SW846 3050	MDIG/14329	SW846 6010B	META/16178
9678547009	**FTSW-SA1-08**	SW846 3050	MDIG/14329	SW846 6010B	META/16178
9678547012	**FTSW-SA3-SW01**	SW846 3015	MDIG/14334	SW846 6010B	META/16194
9678547013	**FTSW-SA3-SW02**	SW846 3015	MDIG/14334	SW846 6010B	META/16194
9678547010	**FTSW-SA1-09**	SW846 3050	MDIG/14355	SW846 6010B	META/16228
9678547011	**FTSW-SA1-10**	SW846 3050	MDIG/14355	SW846 6010B	META/16228
9678547014	**FTSW-HRT-11**	SW846 3050	MDIG/14355	SW846 6010B	META/16228
9678547015	**FTSW-SA3-13**	SW846 3050	MDIG/14355	SW846 6010B	META/16228
9678547016	**FTSW-SA3-14**	SW846 3050	MDIG/14355	SW846 6010B	META/16228
9678547017	**FTSW-SA3-12**	SW846 3050	MDIG/14355	SW846 6010B	META/16228
9678547018	**FTSW-SA3-12D**	SW846 3050	MDIG/14355	SW846 6010B	META/16228
9678547019	**FTSW-SA3-SD02**	SW846 3050	MDIG/14355	SW846 6010B	META/16228
9678547020	**FTSW-SA3-SD01**	SW846 3050	MDIG/14355	SW846 6010B	META/16228
9678547021	**FTSW-SA3-SD01-D**	SW846 3050	MDIG/14355	SW846 6010B	META/16228
9678547012	**FTSW-SA3-SW01**	SW846 3015	MDIG/14335	SW846 6020	META/16247
9678547013	**FTSW-SA3-SW02**	SW846 3015	MDIG/14335	SW846 6020	META/16247
9678547001	**FTSW-HGC-01**	SW846 3050	MDIG/14345	SW846 6020	META/16258
9678547002	**FTSW-AA90MM2-02**	SW846 3050	MDIG/14345	SW846 6020	META/16258
9678547003	**FTSW-AA1-03**	SW846 3050	MDIG/14345	SW846 6020	META/16258
9678547004	**FTSW-AA-03D**	SW846 3050	MDIG/14345	SW846 6020	META/16258

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 9678547 FT STEWART -GA - REV 022607

Lab ID	Sample ID	Prep Batch Method	Prep Batch	Analytical Method	Analytical Batch
9678547005	**FTSW-AA-04**	SW846 3050	MDIG/14345	SW846 6020	META/16258
9678547006	**FTSW-AA1-05**	SW846 3050	MDIG/14345	SW846 6020	META/16258
9678547007	**FTSW-AA1-06**	SW846 3050	MDIG/14345	SW846 6020	META/16258
9678547008	**FTSW-SA1-07**	SW846 3050	MDIG/14345	SW846 6020	META/16258
9678547009	**FTSW-SA1-08**	SW846 3050	MDIG/14345	SW846 6020	META/16258
9678547010	**FTSW-SA1-09**	SW846 3050	MDIG/14345	SW846 6020	META/16258
9678547011	**FTSW-SA1-10**	SW846 3050	MDIG/14345	SW846 6020	META/16258
9678547014	**FTSW-HRT-11**	SW846 3050	MDIG/14345	SW846 6020	META/16258
9678547015	**FTSW-SA3-13**	SW846 3050	MDIG/14345	SW846 6020	META/16258
9678547017	**FTSW-SA3-12**	SW846 3050	MDIG/14345	SW846 6020	META/16258
9678547018	**FTSW-SA3-12D**	SW846 3050	MDIG/14345	SW846 6020	META/16258
9678547019	**FTSW-SA3-SD02**	SW846 3050	MDIG/14356	SW846 6020	META/16258
9678547020	**FTSW-SA3-SD01**	SW846 3050	MDIG/14345	SW846 6020	META/16258
9678547021	**FTSW-SA3-SD01-D**	SW846 3050	MDIG/14356	SW846 6020	META/16258
9678547016	**FTSW-SA3-14**	SW846 3050	MDIG/14429	SW846 6020	META/16326
9678547016	**FTSW-SA3-14**	SW846 3050	MDIG/14429	SW846 6020	META/16334
9678547001	**FTSW-HGC-01**			SM20-2540 G	WETC/40012
9678547002	**FTSW-AA90MM2-02**			SM20-2540 G	WETC/40012
9678547003	**FTSW-AA1-03**			SM20-2540 G	WETC/40012
9678547004	**FTSW-AA-03D**			SM20-2540 G	WETC/40012
9678547005	**FTSW-AA-04**			SM20-2540 G	WETC/40012
9678547006	**FTSW-AA1-05**			SM20-2540 G	WETC/40012
9678547007	**FTSW-AA1-06**			SM20-2540 G	WETC/40012
9678547008	**FTSW-SA1-07**			SM20-2540 G	WETC/40012
9678547009	**FTSW-SA1-08**			SM20-2540 G	WETC/40012
9678547010	**FTSW-SA1-09**			SM20-2540 G	WETC/40012
9678547011	**FTSW-SA1-10**			SM20-2540 G	WETC/40012
9678547014	**FTSW-HRT-11**			SM20-2540 G	WETC/40012
9678547015	**FTSW-SA3-13**			SM20-2540 G	WETC/40012
9678547016	**FTSW-SA3-14**			SM20-2540 G	WETC/40012
9678547017	**FTSW-SA3-12**			SM20-2540 G	WETC/40012
9678547018	**FTSW-SA3-12D**			SM20-2540 G	WETC/40012
9678547019	**FTSW-SA3-SD02**			SM20-2540 G	WETC/40012
9678547020	**FTSW-SA3-SD01**			SM20-2540 G	WETC/40012
9678547021	**FTSW-SA3-SD01-D**			SM20-2540 G	WETC/40012

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CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS

ALL SHADED AREAS MUST BE COMPLETED BY THE CLIENT / SAMPLER. INSTRUCTIONS ON THE BACK.

* 9 6 7 8 5 4 7 *

1 of 3

Client Name: Malcolm Pirnie
Address: 300 E. Lombard St, Suite 610 Baltimore, MD 21202
Contact: David Smith
Phone#: 410 332-4809
Project Name/#: 2118093 Fort Stewart
Bill To: MP
TAT: [X] Normal-Standard TAT is 10-12 business days. [ ] Rush-Subject to ALSI approval and surcharges.
Date Required: ____ Approved By: ____
Email? [X] -Y dsmith@pirnie.com
Fax? [ ] -Y No.: Malcolm Pirnie

ANALYSES/METHOD REQUESTED

Sample Description/Location (as it will appear on the lab report)	Sample Date	Military Time	*G or C	**Matrix	EPA Method 6010B Copper	EPA Method 6020 Lead, Antimony	EPA Method 6010B Copper, Aluminum, Zinc	EPA Method 6020 Lead, Antimony	EPA Method 8330 Explosives	Sample/COC Comments
1 FTSW-HGB-01	3-13-07	1555	C	SO			1	1	1	2 containers total / metals in one jar
2 FTSW-AA10MM2-02	3-13-07	1500	C	SO			1	1	1	2 jars total metals in one
3 FTSW-AA1-03	3-13-07	1605	C	SO			1	1	1	2 JARS metals in one
4 FTSW-AA-03D	3-13-07	1605	C	SO			1	1	1	
5 FTSW-AA-04	3-13-07	1620	C	SO			1	1	1	
6 FTSW-AA-04 MS	3-13-07	1620	C	SO			1	1	1	
7 FTSW-AA-04 MSD	3-13-07	1620	C	SO			1	1	1	
8 FTSW-AA1-05	3-13-07	1645	C	SO			1	1	1	
9 FTSW-AA1-06	3-13-07	1700	C	SO			1	1	1	MS
10 FTSW-SA1-07	3-14-07	1410	C	SO	1	1				One JAR Total

Receipt Information (completed by Receiving Lab)
Cooler Temp: 1 Therm. ID: 51023559
No. of Coolers: ____

	Y	N	Initial
Custody Seals Present?		✓	DBS
(if present) Seals Intact?			
Received on Ice?	✓		
COC/Labels Complete/Accurate?		✓	
Cont. in Good Cond.?	✓		
Correct Containers?	✓		
Correct Sample Volumes?	✓		
Correct Preservation?	✓		
Headspace/Volatiles?			

Courier/Tracking #: FX 799105018040

SAMPLED BY (Please Print): DAVE Smith / Nicole Skelly UKWP
LOGGED BY (signature): [signature] 3-15-07 9:14
REVIEWED BY (signature):

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time
1			2 [signature]	3/17	9:00
3			4		
5			6		
7			8		
9			10		

Data Deliverables: [ ] Standard [ ] CLP-like [ ] NJ-Reduced [ ] NJ-Full [ ] ___
EDDs Required? [ ] Yes, format type: ___
State Samples Collected In: NJ / NJ / NY / PA / Other
SDWA Forms Required? yes / yes / yes / yes
PWSID
ALSI Field Services: [ ] Pickup [ ] Labor [ ] Composite Sampling [ ] Rental Equipment [ ] Other:
DOD Criteria Required?

* G=Grab; C=Composite **Matrix: AI=Air; DW=Drinking Water; GW=Groundwater; OI=Oil; OL=Other Liquid; SL=Sludge; SO=Soil; WP=Wipe; WW=Wastewater
Copies: WHITE-ORIGINAL CANARY-CUSTOMER COPY ***Container Type: AG-Amber Glass; CG-Clear Glass, PL-Plastic. Container Size: 250ml, 500ml, 1L, 8oz, etc. Preservative: HCl, HNO3, NaOH, etc.
Rev 5/06

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CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS

ALL SHADED AREAS MUST BE COMPLETED BY THE CLIENT / SAMPLER. INSTRUCTIONS ON THE BACK.

COC #: 967847 — 2 of 3
ALSI Quote #:

Client Name: Malcolm Pirnie
Address: 300 E. Lombard St. Suite 610 Baltimore, MD 21202
Contact: David Smith
Phone#: 410-332-4809
Project Name/#: 2118093 Fort Stewart
Bill To: MTI
TAT: ☒ Normal-Standard TAT is 10-12 business days. ☐ Rush-Subject to ALSI approval and surcharges.
Date Required: Approved By:
Email? ☒ Y dgsmith@pirnie.com
Fax? ☐ Y No: Malcolm Pirnie

**Container Type / ***Container Size / Preservative

ANALYSES/METHOD REQUESTED

Enter Number of Containers Per Analysis Requested or Field Results Below.

	Sample Description/Location (as it will appear on the lab report)	Sample Date	Military Time	*G or C	**Matrix	EPA method 6010B Copper	EPA method 6020 Lead, Antimony	EPA method 6010B Copper, Aluminum, Zinc	EPA method 8330 Explosives	Sample/COC Comments
9 1	FTSW-SA1-08	3-14-07	1450	C	SO	1	1			1 Jar total
10 2	FTSW-SA1-09	3-14-07	1545	C	SO	1	1			1 Jar total
11 3	FTSW-SA2-10	3-14-07	1005	C	SO	1	1			1 Jar total
12 4	FTSW-SA3-SW01	3-14-07	1715	G	SW	1	1			1 Jar total
13 5	FTSW-SA3-SW02-MS	3-14-07	1725	G	SW	1	1			1 Jar total
6	FTSW-SA3-SW02-MSD	3-14-07	1725	G	SW	1	1			1 Jar total
7	FTSW-SA3-SW02	3-14-07	1723	G	SW	1	1			1 Jar total
14 8	FTSW-~~MR~~T-11	3-15-07	1203	C	SO		1	1	1	2 Jars total
15 9	FTSW-SA3-13	3-15-07	1845	C	SO	1	1			1 Jar total
16 10	FTSW-SA3-14	3-15-07	1845	C	SO	1	1			1 Jar total

UNCERTAIN 3/19/07 1435

SAMPLED BY (Please Print): Nicole Uhl, Dave Smith, Shelby Kolb
LOGGED BY (signature): [signature] 3-16-07 1 pm
REVIEWED BY (signature):

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time
1			2 [signature]	3/17	9:00
3			4		
5			6		
7			8		
9			10		

Receipt Information (completed by Receiving Lab)
Cooler Temp: 1 Therm. ID: 5102355
No. of Coolers:

	Y	N	Initial
Custody Seals Present?		✓	
(If present) Seals Intact?			
Received on Ice?	✓		
COC/Labels Complete/Accurate?		✓	
Cont. in Good Cond.?	✓		
Correct Containers?	✓		
Correct Sample Volumes?	✓		
Correct Preservation?	✓		
Headspace/Volatiles?	✓		

Courier/Tracking #: 799165018790

Data Deliverables: ☐ Standard ☐ CLP-like ☐ NJ-Reduced ☐ NJ-Full ☐
EDDs Required? ☑ If yes, format type: See Pm
State Samples Collected In: NJ NY PA Other ___
SDWA Forms Required? yes yes yes yes
PWSID
DOD Criteria Required? yes
ALSI Field Services: ☐ Pickup ☐ Labor ☐ Composite Sampling ☐ Rental Equipment ☐ Other:

* G=Grab; C=Composite
**Matrix: AI=Air; DW=Drinking Water; GW=Groundwater; OI=Oil; OL=Other Liquid; SL=Sludge; SO=Soil; WP=Wipe; WW=Wastewater
***Container Type: AG-Amber Glass; CG-Clear Glass, PL-Plastic. Container Size: 250ml, 500ml, 1L, 8oz, etc. Preservative: HCl, HNO3, NaOH, etc.
SW - Surface water

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Rev 5/06

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CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS

ALL SHADED AREAS MUST BE COMPLETED BY THE CLIENT / SAMPLER. INSTRUCTIONS ON THE BACK.

COC #: 9678847 — 3 of 3
ALSI Quote #:

Client Name: Malcolm Pirnie
Address: 300 E Lombard St Suite 610 Baltimore MD 21202
Contact: David Smith
Phone#: 410 332-4809
Project Name/#: 2118-093 Fort Stewart
Bill To: MPI
TAT: [x] Normal-Standard TAT is 10-12 business days. [ ] Rush-Subject to ALSI approval and surcharges.
Date Required: Approved By:
Email? [x] Y dgsmith@pirnie.com
Fax? [ ] Y No.: Malcolm Pirnie

ANALYSES/METHOD REQUESTED: EPA Method 6010B Copper; EPA Method 6020 lead Antimony; Sb, Cu, Pb

Enter Number of Containers Per Analysis Requested or Field Results Below.

	Sample Description/Location (as it will appear on the lab report)	Sample Date	Military Time	*G or C	**Matrix	EPA Method 6010B Copper	EPA Method 6020 lead Antimony	Sb, Cu, Pb	Sample/COC Comments
16	1 FTSW-SA3-MS	1855	3.507	C	SO	1	1		1 Jar total
	2 FTSW-SA3-14MSD	1855	3.507	C	SO	1	1		1 Jar total
17	3 FTSW-SA3-12	3.15.07	1830	C	SO	1	1		1 Jar total
18	4 FTSW-SA3-12D	3-15-07	1830	C	SO	1	1		1 Jar total
19	5 FTSW-SA3-SD02(MS/MSD)	3-14-07	1745		S			3	Rcvd but not on COC.
20	6 FTSW-SA3-SD01	3-14-07	1800					1	SA 3-19-07
	7 FTSW-SA3-SD01-D	3-14-07	1800					1	
	8								
	9								
	10								

Added per Sully C Malcolm Pirnie

ENTERED 3/19/07 1455

Receipt Information (completed by Receiving Lab)
Cooler Temp: 1 Therm. ID: 51023559
No. of Coolers:

	Y	N	Initial
Custody Seals Present?		/	TBS
(If present) Seals Intact?			
Received on Ice?	/		
COC/Labels Complete/Accurate?		/	
Cont. in Good Cond.?	/		
Correct Containers?	/		
Correct Sample Volumes?	/		
Correct Preservation?	/		
Headspace/Volatiles?			

PV Courier/Tracking #: 799105018740

SAMPLED BY (Please Print): Nicole Sikula, David Smith, Shelly Kell
LOGGED BY (signature): [signature] 3-16-07 9:40
REVIEWED BY (signature):

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time
1			2 [signature]	3/17	900
3			4		
5			6		
7			8		
9			10		

Data Deliverables: [ ] Standard [ ] CLP-like [ ] NJ-Reduced [ ] NJ-Full [ ]
EDDs Required? [x] If yes, format type: See 1M
State Samples Collected In: MD / NJ / NY / PA / Other / PWSID
DOD Criteria Required? yes
ALSI Field Services: [ ] Pickup [ ] Labor [ ] Composite Sampling [ ] Rental Equipment [ ] Other:

* G=Grab; C=Composite **Matrix: AI=Air; DW=Drinking Water; GW=Groundwater; OI=Oil; OL=Other Liquid; SL=Sludge; SO=Soil; WP=Wipe; WW=Wastewater
***Container Type: AG-Amber Glass; CG-Clear Glass; PL-Plastic. Container Size: 250ml, 500ml, 1L, 8oz, etc. Preservative: HCl, HNO3, NaOH, etc.

Copies: WHITE-ORIGINAL, CANARY-CUSTOMER COPY — Rev 5/06

Appendix D: Global Positioning System Data

GPS Data

Data Point	Description	Coordinates (meters)	
		Easting	Northing
Anti-Aircraft Range - 1			
munitions debris	munitions debris	437334.165	3551927.307
munitions debris	munitions debris	437333.134	3551923.953
smoke grenade expended	smoke grenade expended	437338.446	3551919.903
pop flare	pop flare	437245.908	3551939.193
sub cal rocket	sub cal rocket	437184.683	3551949.153
sub cal rocket	sub cal rocket	437185.369	3551922.245
sub cal rockets	sub cal rockets	437183.731	3551921.151
sub cal rockets	sub cal rockets	437183.908	3551878.070
sub cal rockets	sub cal rockets	437183.317	3551856.219
sub cal rockets	sub cal rockets	437181.281	3551808.420
unknown met debris	unknown met debris	437209.290	3551928.011
sub cal rockets	sub cal rockets	437207.325	3551880.791
sub cal rockets 20 plus	sub cal rockets 20 plus	437207.695	3551881.090
sub cal rockets 20 plus	sub cal rockets 20 plus	437217.516	3551887.077
sub cal rockets	sub cal rockets	437219.205	3551892.539
sub cal rockets	sub cal rockets	437224.390	3551867.024
tire	tire	437221.563	3551863.073
mound	mound	437231.374	3551804.066
table	table	437271.286	3551892.442
pop flare	pop flare	437272.713	3551831.399
flare	flare	437318.775	3551904.251
flare	flare	437327.068	3551900.185
flare	flare	437339.847	3551876.393
unknown debris	unknown debris	437569.019	3551844.777
booby trap simulator	booby trap simulator	438220.929	3551672.510
FTSW-AAR1-03	FTSW-AAR1-03	437183.588	3551880.885
FTSW-AAR1-04	FTSW-AAR1-04	437221.401	3551865.727
FTSW-AAR1-05	FTSW-AAR1-05	437419.050	3551838.325
FTSW-AAR1-06	FTSW-AAR1-06	437831.319	3551755.183
Anti-Aircraft Range 90mm - 2			
FTSW-AAR90mm-02	FTSW-AAR90mm-02	437781.100	3531997.495
Hand Grenade Course			
FTSW-HGC-01	FTSW-HGC-01	436422.406	3530862.252
Small Arms Range - 1			
FTSW-SA1-10	FTSW-SA1-10	452207.037	3534300.086
FTSW-SA1-09	FTSW-SA1-09	452118.689	3534293.755
FTSW-SA1-08	FTSW-SA1-08	451728.497	3533606.168
FTSW-SA1-07	FTSW-SA1-07	451542.156	3533856.459
Small Arms Range – 3			

FTSW-SM3-02SW	FTSW-SM3-02SW	447325.650	3531005.312
FTSW-SM3-02SED	FTSW-SM3-02SED	447325.650	3531005.312
FTSW-SA3-14	FTSW-SA3-14	447169.886	3530757.518
FTSW-SM3-12	FTSW-SM3-12	447418.242	3530768.299
FTSW-SM3-01SW	FTSW-SM3-01SW	447475.693	3530871.459
FTSW-SM3-01SED	FTSW-SM3-01SED	447475.693	3530871.459
FTSW-SM3-13	FTSW-SM3-13	447248.653	3530979.791
SignMine	Sign stating “mines”	452402.753	3534168.313
BarbedWire	Barbed wire fence area	452348.681	3534195.986
Hero Road Trench Area			
FTSW-HRT-11	FTSW-HRT-11	442312.266	3527197.396

Coordinate System: UTM Zone 17 North; Datum: NAD 1983; Units: Meters.

Appendix E: Cost-to-Complete

Army Environmental Database-Restoration (AEDB-R) Data
Version 11/10/2006

The information below was initially collected during the Phase 3 Inventory as ARID data. Since that time, a Historical Records Review (HRR) and Site Inspection (SI) have been completed at the site. As a result of the HRR and SI findings, some responses have been updated from those initially indicated. Note that several items have drop down lists. Select the cell and the drop down list will appear.

Installation Name: Fort Stewart, Georgia

GENERAL

AEDBR Site ID: FTSW-002-R-01

Site Description: Anti-Aitcraft Range 90-mm - 2

NPL Status: No

Site Narrative: This MRS is a 77-acre parcel, located northwest of the cantonment area, where two different types of historical munitions uses occurred. These uses included anti-aircraft and tank training and occurred on a total of six separate/collocated ranges from 1941 through 1964. The MRS is positioned in the downrange portion of these ranges and does not overlap impact/target areas or firing points. The known munitions associated with this MRS include 40-mm and 90-mm anti-aircraft projectiles. The munitions used on the tank range are unknown. However, archival documents from 1941 indicate that 37-, 40-, and 90-mm HE and 37-, 40-, and 90-mm practice rounds with tracers were issued to FTSW. Therefore, it is assumed that these munitions could have been used on this MRS. Numerous EOD calls involving C-4 plastic explosives (secondary explosives), M-222 Dragon HE anti-tank guided missiles, M-7 grenades (riot control agent), and MK-2 fragmentation hand grenades were reported on this site. Table 4-6 lists the specific munitions that potentially were used at Anti-Aircraft Range 90-mm - 2 based on the HRR f

Site Type: Firing Range

POC

POC Name: Algeanna Stevenson

POC Phone Number: (912) 315-4226

SITE OWNERSHIP AND LOCATIONS

Site 100% Owned by DoD: Yes

If not 100% Owned by DoD, who has ownership Control:

If not 100% Owned by DoD, who has ownership Control:	
If not 100% Owned by DoD, who has ownership Control:	
Other Description:	
Is site located on property that is leased to another entity:	No
If leased, to whom is the property leased:	
Other Description:	
Is site located on property that was leased in the past but is not now?	No
Is site on property that was previously withdrawn land?	No
Location City:	Hinesville
Location County:	Bryan, Evans, Liberty, Long, and Tattnall counties
Location State:	GA
UTM Datum:	NAD83 (1983 North American Datum)
UTM Zone:	18
X Coordinate:	
Y Coordinate:	

SITE ATTRIBUTES

Site Status:	Closed
On Range:	Yes
Site Size (Acres):	77
Acres known or identified to contain military munitions.:	0
Acres suspected to contain military munitions:	77

Acres not suspected to contain military munitions:	0
Soil Type:	Sand-Silt/Sand-Clay
Topography:	Flat
Vegetation:	Barren or low grass
Drinking Water Aquifer:	
EPA Designated Sole Source Aquifer:	No
Groundwater Depth (feet):	
Munitions Constituent Contamination:	No
Munitions Constituent Media 1:	Soil
Munitions Constituent Media 2:	
Munitions Constituent Media 3:	
Munitions Density:	Unknown
Range Classification:	Training
Range Classification "Other" Description:	anti-aircraft and tank training and occurred on a total of six separate/collocated ranges from 1941 through 1964. The MRS is positioned in the downrange portion of these ranges and does not overlap impact/target areas or firing points.
Land Use Access Controls 1:	Fences
Land Use Access Controls 2:	Guards
Land Use Access Controls 3:	Locked gates
Access "Other' Description:	
Land Use Restrictions 1:	
Land Use Restrictions 2:	

Land Use Restrictions 3:	
Restrictions "Other" Description:	
Public Accessibility:	No Public Access
Historic Use 1:	Other
Start Year:	1941
End Year:	
Historic Use 2:	Artillery
Start Year:	1941
End Year:	4964
Historic Use 3:	Artillery
Start Year:	1941
End Year:	1964
Historic Use 4:	Artillery
Start Year:	1957
End Year:	1964
Current Use 1:	Other
Start Year:	unknown
End Year:	present
Current Use 2:	
Start Year:	
End Year:	
Current Use 3:	
Start Year:	
End Year:	
Current Use 4:	
Start Year:	
End Year:	
Current Use "Other" Description:	Ammunition Supply Point

RACER Cost Estimating Data - MEC

FTSW-002-R-01

Note that some of the information included here may appear redundant to what was provided in AEDB-R. Some of the choices in the drop down lists, however, may be different than the AEDB-R choices.

Installation Name:	Fort Stewart
AEDB-R Site ID:	FTSW-002-R-01
Site Name:	Anti-Aircraft Rane 90-mm - 2
Range/Site Acreage:	77 acres
Characterization Area (if different than total acreage):	
Topography:	Flat
Vegetation:	Barren or Low Grass
Range Type 1:	Artillery (200 anomalies/acre)
Range Type 2:	Mortar (250 anomalies/acre)
Range Type 3:	Multiple/Combined Use (400 anomalies/acre)
Range Type 4:	
Ordnance Type 1:	Large Caliber (37mm and larger) (CTT11)
Ordnance Type 2:	Demolition Materials (TNT, Dynamite, Black Powder, Detonators, Blasting Caps, Fuses, Cratering Charges, Bangalore Torpedoes etc.) (CTT04)
Ordnance Type 3:	Hand Grenades, Live (CTT05)
Ordnance Type 4:	
Ordnance Type 5:	
Anomalies/acre:	unknown
Percent scrap:	unknown
Comment:	90-mm anti-aircraft high explosive (HE), and 40-mm anti-aircraft HE were used at this site. The EOD has responded to several emergency calls in the area. All of the responses were in the same area. The ordnance and explosives (OE) encountered included C-4 plastic explosives (secondary explosives), M-222 and GM Dragon Missiles (guided missiles), M-7 grenades (a riot control agent), and MK-2 fragmentation hand grenades. The dates and exact number of occurrences of the EOD calls are not known. No information and no reports from installation personnel regarding UXO investigation being performed on the site were obtained during the site visit.

Cost Estimating Data - MC

Small Arms Ranges (expended only)	
Likelihood of Lead Contamination Requiring Remediation:	Possible
Sampling Area (Acres):	77 acres
Contaminated Area (square feet):	N/A
Depth of Contamination (feet):	N/A

Multi-Use Ranges (Contain MEC)	
Likelihood of MC Contamination (Soil):	Unlikely (Confirmation Sampling)
Likelihood of MC Contamination (Groundwater):	
Sampling Area (Acres):	5 composite surface soil samples across 10 percent of the total site acreage ~77 acre
Contaminated Area (square feet):	N/A
Depth of Contamination (feet)	N/A
Notes:	One composite surface soil sample was collected and was analyzed for aluminum, copper, zinc (USEPA Method 6010B), lead, antimony (USEPA Method 6020), and explosives (USEPA Method 8330) from the Anti-Aircraft Range 90mm – 2 . The analytical data were summarized in Table 4-5, and the sample location is shown on Map 4-2. The results of the soil sampling analysis at the Anti-Aircraft Range 90 mm – 2 indicate that, with the exception of zinc, all metals analyzed were below FTSW established background levels. No explosive compounds were detected above laboratory detection or method reporting limits.

Army Environmental Database-Restoration (AEDB-R) Data
Version 11/10/2006

The information below was initially collected during the Phase 3 Inventory as ARID data. Since that time, a Historical Records Review (HRR) and Site Inspection (SI) have been completed at the site. As a result of the HRR and SI findings, some responses have been updated from those initially indicated. Note that several items have drop down lists. Select the cell and the drop down list will appear.

Installation Name: Fort Stewart, Georgia

GENERAL

AEDBR Site ID: FTSW-008-R-01

Site Description: Hero Road Trench Area

NPL Status: No

Site Narrative: The Hero Road Trench Area is a 10-acre parcel located within the cantonment area that was identified in January 2003 when a former DPW staff member reported to the DPW Environmental Office that materials (i.e., mustard gas) had been buried in the DPW Family Housing Maintenance parking lot located on Hero Road (FTSW0091).

Site Type: Chemical Disposal

POC

POC Name: Algeanna Stevenson

POC Phone Number: (912) 315-4226

SITE OWNERSHIP AND LOCATIONS

Site 100% Owned by DoD: Yes

If not 100% Owned by DoD, who has ownership Control:

If not 100% Owned by DoD, who has ownership Control:

If not 100% Owned by DoD, who has ownership Control:

Other Description:

Is site located on property that is leased to another entity:	No
If leased, to whom is the property leased:	
Other Description:	
Is site located on property that was leased in the past but is not now?	No
Is site on property that was previously withdrawn land?	No
Location City:	Hinesville
Location County:	Bryan, Evans, Liberty, Long, and Tattnall counties
Location State:	GA
UTM Datum:	NAD83 (1983 North American Datum)
UTM Zone:	18
X Coordinate:	
Y Coordinate:	

SITE ATTRIBUTES

Site Status:	Closed
On Range:	Yes
Site Size (Acres):	10
Acres known or identified to contain military munitions.:	0
Acres suspected to contain military munitions:	10
Acres not suspected to contain military munitions:	0
Soil Type:	Sand-Silt/Sand-Clay
Topography:	Flat
Vegetation:	Shrubs and some trees

Drinking Water Aquifer:

EPA Designated Sole Source Aquifer: No

Groundwater Depth (feet):

Munitions Constituent Contamination: No

Munitions Constituent Media 1: Soil

Munitions Constituent Media 2:

Munitions Constituent Media 3:

Munitions Density: Unknown

Range Classification: Other

Range Classification "Other" Description: In 1941 and 1951, CWM training and supplies existed at FTSW and, thus, it is likely that any potential items buried at the Hero Road Trench Area are related to this training.

Land Use Access Controls 1: Fences

Land Use Access Controls 2: Locked gates

Land Use Access Controls 3:

Access "Other' Description:

Land Use Restrictions 1:

Land Use Restrictions 2:

Land Use Restrictions 3:

Restrictions "Other" Description:

Public Accessibility: No Public Access

Historic Use 1: Other

Start Year: 1941

End Year:	1951
Historic Use 2:	
Start Year:	
End Year:	
Historic Use 3:	
Start Year:	
End Year:	
Historic Use 4:	
Start Year:	
End Year:	
Current Use 1:	Other
Start Year:	unknown
End Year:	present
Current Use 2:	
Start Year:	
End Year:	
Current Use 3:	
Start Year:	
End Year:	
Current Use 4:	
Start Year:	
End Year:	
Current Use "Other" Description:	Family Housing Maintenance parking lot

RACER Cost Estimating Data - MEC

FTSW-008-R-01

Note that some of the information included here may appear redundant to what was provided in AEDB-R. Some of the choices in the drop down lists, however, may be different than the AEDB-R choices.

Installation Name:	Fort Stewart
AEDB-R Site ID:	FTSW-008-R-01
Site Name:	Hero Road Trench Area
Range/Site Acreage:	10 acres
Characterization Area (if different than total acreage):	
Topography:	Flat
Vegetation:	Shrubs with Some Trees
Range Type 1:	Burial Pits (0 anomalies/acre)
Range Type 2:	
Range Type 3:	
Range Type 4:	
Ordnance Type 1:	Other (Toxic Chemical Munitions, Sea Mines, Torpedoes, CADS, etc.) (CTT17)
Ordnance Type 2:	
Ordnance Type 3:	
Ordnance Type 4:	
Ordnance Type 5:	
Anomalies/acre:	unknown
Percent scrap:	unknown
Comment:	1941 and 1951, CWM training and supplies existed at FTSW and, thus, it is likely that any potential items buried at the Hero Road Trench Area are related to this training. A geophysical study was conducted on September 5th and 19th, 2003, to investigate approximately 4 acres off of Hero Road around the Family Housing Maintenance parking lot. The area was densely wooded with the exception of the 0.4-acre parking lot. Many anomalies were noted, but it was unknown if they were a result of natural voids (possibly due to root vaults) or buried materials

Cost Estimating Data - MC

Small Arms Ranges (expended only)

Likelihood of Lead Contamination Requiring Remediation:	Unlikely (Confirmation Sampling)
Sampling Area (Acres):	10
Contaminated Area (square feet):	N/A
Depth of Contamination (feet):	N/A

Multi-Use Ranges (Contain MEC)

Likelihood of MC Contamination (Soil):	Possible
Likelihood of MC Contamination (Groundwater):	
Sampling Area (Acres):	5 composite surface soil samples across 10 percent of the total site acreage ~10 acre
Contaminated Area (square feet):	N/A
Depth of Contamination (feet)	N/A

Notes:

One composite surface soil sample was collected from the Hero Road Trench Area and analyzed for aluminum, copper, and zinc (USEPA Method 6010B); lead and antimony (USEPA Method 6020); and explosives (USEPA Method 8330).
The following are the results of the soil sampling analysis at the Hero Road Trench Area:
• Lead: The sample did not exceed the residential PRG for lead. The sample exceeded the FTSW established background level for lead and the Region 4 ecological screening value for lead in surface soil.
• Other metals: The sample did not exceed the residential PRGs, the FTSW established background levels, or the Region 4 ecological screening values for aluminum, antimony, copper, or zinc.
• Explosives: No explosives were detected above laboratory reporting or method detection limits.

Appendix F: Munitions Response Site Prioritization Protocol

DEPARTMENT OF THE ARMY
US ARMY INSTALLATION MANAGEMENT COMMAND
US ARMY GARRISON, FORT STEWART / HUNTER ARMY AIRFIELD
DIRECTORATE OF PUBLIC WORKS
1587 FRANK COCHRAN DRIVE
FORT STEWART, GEORGIA 31314

REPLY TO
ATTENTION OF

Directorate of Public Works

CERTIFIED MAIL

Georgia Environmental Protection Division
Hazardous Waste Management Branch
Attention: Mr. Ghazi
Floyd Towers East, Suite 1154
2 Martin Luther King, Jr. Drive S.E.
Atlanta, GA 30334

Dear Mr. Ghazi:

As a lead agency and in accordance with the 32 Code of Federal Regulations 179.5 requirements, Fort Stewart is providing this notification that a Military Munitions Response Program (MMRP) Confirmatory Sampling (CS) event, which is intended to meet the requirements of a MMRP Site Inspection (SI) under CERCLA was completed in May 2007. MMRP sites (Anti-Aircraft Range -1; Anti-Aircraft Range 90mm-2; Anti-Tank Range 90mm; Hand Grenade Course; Small Arms Range-1; Small Arms Range-3; and Hero Road Trench Site) established during the SI process were initially evaluated and scored by applying the Munitions Response Site Prioritization Protocol (MRSPP). The MRSPP evaluation criteria included assessing types of munitions which may be potentially present, assessing land uses, determining ease of access to sites, and quantifying the number of people with access to sites.

The draft MRRP scores were provided for your review in the Draft CS Report. You may elect to simply review and provide input on the initial scores within the Draft CS Report. MMRP scores will be considered final in the Final CS Report. In accordance with the 32 CFR Part 179 requirements and prior to finalizing these scores, we are soliciting stakeholder interest in participation in the scoring process. If you, or any applicable stakeholder, are interested in participating in the scoring process, a meeting can be setup. If no such requests are received within 30-days of this letter, then the MRSPP scores, as presented in the Final CS Report, will be considered final.

Should you have any questions regarding the application of MRSPP, please contact Ms. Algeana Stevenson at (912) 315-4226 or Ms. Tressa Rutland, Directorate of Public Works, Environmental Branch, at (912) 767-2010.

Sincerely,

Thomas C. Fry

for Michael W. Biering, P.E.,CFM
Director, Public Works

Enclosures

STATE OF GEORGIA
COUNTY OF LIBERTY

Personally appeared before me, the undersigned Notary Public

Mark Griffin

who after being duly sworn state under oath that he is the

Publisher

of the Coastal Courier newspaper, a newspaper of general circulation in the city of Hinesville, Georgia, and who further states under oath that the advertisement attached hereto and made a part of this affidavit appeared in the Coastal Courier on Oct. 31, 2007.

Marshall Griffin

Sworn to and subscribed before me,

this 22 day of Oct., 2007

Elly Mattingly

ELLY MATTINGLY
NOTARY
My Comm. Exp. Dec. 4, 2007
PUBLIC
LIBERTY COUNTY, GA

Errors - The liability of the publisher on account of errors in or omissions from any advertisement will in no way exceed the amount of the charge for the space occupied by the item in error; and then only for the first incorrect insertion.

MRSPP Public Notice

The Department of Defense (DoD) has conducted live-fire training and testing of weapon systems at active and former military installation throughout the United States to ensure force readiness and defend our nation. The Army and Fort Stewart are in the process of completing a site inspection of former munitions-related activities on Fort Stewart. Through direction provided by Congress, the DoD has developed the Munitions Response Site Prioritization Protocol (MRSPP) which assigns priorities to defense sites containing unexploded ordnance, discarded military munitions or munitions constituents. The MRSPP evaluation criteria includes assessing types of munitions that may be potentially present, assessing land uses, determining ease of access to sites, and quantifying the number of people with access to sites.

Information collected will be used to apply the MRSPP at three former anti-aircraft ranges; a former hand grenade course; two former small arms ranges; and a former Fort Stewart landfill. The information will be made available for public review at the Fort Stewart Environmental Prevention and Compliance Branch, DPW, Building 1137, in accordance with the 32 CFR Part 179 requirements November 5, 2007.

If you have or would like additional information about these Munitions Response Sites or other potential Munitions Response Sites associated with Fort Stewart, please contact: (Randy Powell-Jones, 1550 Frank Cochran Drive, Fort Stewart, GA 31314-4927, (912) 315-5109, or Randy.Powell-Jones@stewart.army.mil)

26798

(Oct.21)

Site Prioritization Summary Table Fort Stewart, Georgia				
Site Name	**EHE Module Rating**	**CHE Module Rating**	**HHE Module Rating**	**Overall Priority Rating**
Anti-Aircraft Range 90-mm - 2	4	No Known or Suspected CWM Hazard	No Known or Suspected MC Hazard	4
Small Arms Range 3	No Known or Suspected Explosive Hazard	No Known or Suspected CWM Hazard	No Known or Suspected MC Hazard	No Known or Suspected Hazard
Hero Road Trench Area	8	6	No Known or Suspected MC Hazard	6

Chemical Warfare Materiel Hazard Evaluation (CHE)
Explosives Hazard Evaluation (EHE)
Feasibility Study (FS)
Health Hazard Evaluation (HHE)
Munitions Constituents (MC)
Munitions and Explosives of Concern (MEC)
No Further Action (NFA)
Remedial Investigation (RI)
Site Investigation (SI)

The EHE & CHE Rating is determined by selecting the appropriate EHE Module Score range using the sum of the nine data element site scores:

EHE & CHE Module Score	EHE & CHE Rating
92 to 100	EHE Rating A (Highest)
82 to 91	EHE Rating B
71 to 81	EHE Rating C
60 to 70	EHE Rating D
48 to 59	EHE Rating E
38 to 47	EHE Rating F
0 to 37	EHE Rating G (Lowest)

Alternative Module Ratings

Evaluation Pending

No Longer Required

No Known or Suspected Explosive Hazard or No Known or suspected CWM Hazard

The HEE is determined by the selection of the appropriate HEE Module Rating (A through G) using the HHE three letter combination levels:

Combination	Rating
HHHHHH	A
HHM	B
HHL	C
HMM	C
HML	D
MMM	D
HLL	E
MML	E
MLL	F
LLL	G
Alternative Module Ratings	Evaluation Pending
	No Longer Required
	No Known or Suspected MC Hazard

The MRS Priority is based on the highest Hazard Evaluation Module:

Explosives Hazard Evaluation Module Rating	Priority	Chemical Warfare Materiel Hazard Evaluation Module Rating	Priority	Health Hazard Evaluation Module Rating	Priority
A (Lowest)	2	A (Lowest)	1	A (Lowest)	2
B	3	B	2	B	3
C	4	C	3	C	4
D	5	D	4	D	5
E	6	E	5	E	6
F	7	F	6	F	7
G (Lowest)	8	G (Lowest)	7	G (Lowest)	8
Evaluation Pending		Evaluation Pending		No Longer Required	
No Longer Required		No Longer Required		Evaluation Pending	
No Known or Suspected Explosive Hazard		No Known or Suspected CWM Hazard		No Known or Suspected MC Hazard	

Table A

MRS Background Information

DIRECTIONS: Record the background information below for the MRS to be evaluated. Much of this information is available from Service and DoD databases. If the MRS is located on a FUDS property, the suitable FUDS property information should be substituted. In the **MRS Summary**, briefly describe the UXO, DMM, or MC that are known or suspected to be present, the exposure setting (the MRS's physical environment), any other incidental nonmunitions-related contaminants (e.g., benzene, trichloroethylene) found at the MRS, and any potentially exposed human and ecological receptors. If possible, include a map of the MRS.

Munitions Response Site Name: **Anti-Aircraft Range 90-mm 2 (FTSW-002-R-01)**

Component: **US Army**

Installation/Property Name: **Ft. Stewart**

Location (City, County, State): **Ft. Stewart, Liberty County, GA**

Site Name/Project Name (Project No.): **Ft. Stewart MRSPP SI (2118093)**

Date Information Entered/Updated: **July 24, 2007**

Point of Contact (Name/Phone): **Shelly Kolb, Malcolm Pirnie, Inc./ (410) 230-9958**

Project Phase (check only one):

❑ PA	✠ SI	❑ RI	❑ FS	❑ RD
❑ RA-C	❑ RIP	❑ RA-O	❑ RC	❑ LTM

Media Evaluated (check all that apply):

❑ Groundwater	❑ Sediment (human receptor)
✠ Surface soil	❑ Surface Water (ecological receptor)
❑ Sediment (ecological receptor)	❑ Surface Water (human receptor)

MRS Summary:

MRS Description: Describe the munitions-related activities that occurred at the installation, the dates of operation, and the UXO, DMM, or MC known or suspected to be present. When possible, identify munitions, CWM, and MC by type: These uses included anti-aircraft and tank training and occurred on a total of six separate/collocated ranges from 1941 through 1964. . The known munitions associated with this MRS include 40-mm and 90-mm anti-aircraft projectiles. No MEC or munitions debris was observed in the field.

Description of Pathways for Human and Ecological Receptors: The pathways for all human and ecological receptors are potentially complete as there is potential for these receptors to encounter MEC on the surface. Potentially complete pathways for installation personnel, contractors, and biota for MEC in the subsurface may exist as these receptors have the potential to conduct intrusive activities. The pathway for MEC in the subsurface is incomplete for all other receptors. Biota have potentially complete pathways for subsurface soil, shallow ground water, and surface soil.

Description of Receptors (Human and Ecological): The current human receptors of potential MEC or MC on Anti-Aircraft Range 90-mm - 2 include authorized installation personnel, contractors, visitors. Based the fact that the site is particularly developed and fenced, the ecological diversity is low.

Table 1

EHE Module: Munitions Type Data Element Table

DIRECTIONS: Below are 11 classifications of munitions and their descriptions. Circle the scores that correspond with **all** the munitions types known or suspected to be present at the MRS.

Note: The terms *practice munitions, small arms ammunition, physical evidence,* and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Score
Sensitive	◆ UXO that are considered most likely to function upon any interaction with exposed persons (e.g., submunitions, 40mm high-explosive [HE] grenades, white phosphorus [WP] munitions, high-explosive antitank [HEAT] munitions, and practice munitions with sensitive fuzes, but excluding all other practice munitions). ◆ Hand grenades containing energetic filler. ◆ Bulk primary explosives, or mixtures of these with environmental media, such that the mixture poses an explosive hazard.	**<u>30</u>**
High explosive (used or damaged)	◆ UXO containing a high-explosive filler (e.g., RDX, Composition B), that are not considered "sensitive." ◆ DMM containing a high-explosive filler that have: ▪ Been damaged by burning or detonation ▪ Deteriorated to the point of instability.	**<u>25</u>**
Pyrotechnic (used or damaged)	◆ UXO containing a pyrotechnic filler other than white phosphorus (e.g., flares, signals, simulators, smoke grenades). ◆ DMM containing a pyrotechnic filler other than white phosphorus (e.g., flares, signals, simulators, smoke grenades) that have: ▪ Been damaged by burning or detonation ▪ Deteriorated to the point of instability.	20
High explosive (unused)	◆ DMM containing a high-explosive filler that: ▪ Have not been damaged by burning or detonation ▪ Are not deteriorated to the point of instability.	15
Propellant	◆ UXO containing mostly single-, double-, or triple-based propellant, or composite propellants (e.g., a rocket motor). ◆ DMM containing mostly single-, double-, or triple-based propellant, or composite propellants (e.g., a rocket motor) that are: ▪ Damaged by burning or detonation ▪ Deteriorated to the point of instability.	15
Bulk secondary high explosives, pyrotechnics, or propellant	◆ DMM containing mostly single-, double-, or triple-based propellant, or composite propellants (e.g., a rocket motor). ◆ DMM that are bulk secondary high explosives, pyrotechnic compositions, or propellant (not contained in a munition), or mixtures of these with environmental media such that the mixture poses an explosive hazard.	10
Pyrotechnic (not used or damaged)	◆ DMM containing a pyrotechnic filler (i.e., red phosphorus), other than white phosphorus filler, that: ▪ Have not been damaged by burning or detonation ▪ Are not deteriorated to the point of instability.	10
Practice	◆ UXO that are practice munitions that are not associated with a sensitive fuze. ◆ DMM that are practice munitions that are not associated with a sensitive fuze and that have not: ▪ Been damaged by burning or detonation ▪ Deteriorated to the point of instability.	**<u>5</u>**
Riot control	◆ UXO or DMM containing a riot control agent filler (e.g., tear gas).	**<u>3</u>**
Small arms	◆ Used munitions or DMM that are categorized as small arms ammunition. (Physical evidence or historical evidence that no other types of munitions [e.g., grenades, subcaliber training rockets, demolition charges] were used or are present on the MRS is required for selection of this category.)	2
Evidence of no munitions	◆ Following investigation of the MRS, there is physical evidence that there are no UXO or DMM present, or there is historical evidence indicating that no UXO or DMM are present.	0
MUNITIONS TYPE	**DIRECTIONS:** Record <u>**the single highest score**</u> from above in the box to the right (maximum score = 30).	**<u>30</u>**

DIRECTIONS: Document any MRS-specific data used in selecting the ***Munitions Type*** classifications in the space provided.

Site was chosen as sensitive, because according to information obtained during the Phase 3 site visit and HRR, 90-mm anti-tank HE, 40-mm anti-aircraft HE, and small arms were used at the site. Numerous EOD calls involving C-4 plastic explosives (secondary explosives), M-222 Dragon high explosive anti-tank guided missile, M-7 grenades (riot control

Table 1

EHE Module: Munitions Type Data Element Table

DIRECTIONS: Below are 11 classifications of munitions and their descriptions. Circle the scores that correspond with **all** the munitions types known or suspected to be present at the MRS.

Note: The terms *practice munitions, small arms ammunition, physical evidence,* and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Score
agent), and MK-2 fragmentation hand grenades were reported on this site. (CS Report, Section 4.2.1)		

Table 2

EHE Module: Source of Hazard Data Element Table

DIRECTIONS: Below are 11 classifications describing sources of explosive hazards. Circle the scores that correspond with **all** the sources of explosive hazards known or suspected to be present at the MRS.

Note: The terms *former range, practice munitions, small arms range, physical evidence,* and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Score
Former range	◆ The MRS is a former military range where munitions (including practice munitions with sensitive fuzes) have been used. Such areas include impact or target areas and associated buffer and safety zones.	**10**
Former munitions treatment (i.e., OB/OD) unit	◆ The MRS is a location where UXO or DMM (e.g., munitions, bulk explosives, bulk pyrotechnic, or bulk propellants) were burned or detonated for the purpose of treatment prior to disposal.	8
Former practice munitions range	◆ The MRS is a former military range on which only practice munitions without sensitive fuzes were used.	6
Former maneuver area	◆ The MRS is a former maneuver area where no munitions other than flares, simulators, smokes, and blanks were used. There must be evidence that no other munitions were used at the location to place an MRS into this category.	5
Former burial pit or other disposal area	◆ The MRS is a location where DMM were buried or disposed of (e.g., disposed of into a water body) without prior thermal treatment.	5
Former industrial operating facilities	◆ The MRS is a location that is a former munitions maintenance, manufacturing, or demilitarization facility.	4
Former firing points	◆ The MRS is a firing point, where the firing point is delineated as an MRS separate from the rest of a former military range.	4
Former missile or air defense artillery emplacements	◆ The MRS is a former missile defense or air defense artillery (ADA) emplacement not associated with a military range.	2
Former storage or transfer points	◆ The MRS is a location where munitions were stored or handled for transfer between different modes of transportation (e.g., rail to truck, truck to weapon system).	2
Former small arms range	◆ The MRS is a former military range where only small arms ammunition was used. (There must be evidence that no other types of munitions [e.g., grenades] were used or are present to place an MRS into this category.)	1
Evidence of no munitions	◆ Following investigation of the MRS, there is physical evidence that no UXO or DMM are present, or there is historical evidence indicating that no UXO or DMM are present.	0
SOURCE OF HAZARD	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 10).	**10**

DIRECTIONS: Document any MRS-specific data used in selecting the ***Source of Hazard*** classifications in the space provided.

Former range was chosen, because the area is comprised of the following overlapping range fans: the buffer area (near the firing point) of an Anti-Tank Range 90-mm (total acreage approximately 16,128, operational in 1941); the buffer area (near the firing point) of an Anti-Aircraft Range 40-mm (total acreage approximately 25,288, operational in 1941); and a portion of a Small Arms Range (total acreage approximately 1,241, operational in 1941). (CS Report, Section 4.2.1)

Table 3

EHE Module: Location of Munitions Data Element Table

DIRECTIONS: Below are eight classifications of munitions locations and their descriptions. Circle the scores that correspond with **all** the locations where munitions are known or suspected to be present at the MRS.

Note: The terms *confirmed, surface, subsurface, small arms ammunition, physical evidence,* and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Score
Confirmed surface	◆ Physical evidence indicates that there are UXO or DMM on the surface of the MRS. ◆ Historical evidence (i.e., a confirmed report such as an explosive ordnance disposal [EOD], police, or fire department report that an incident or accident that involved UXO or DMM occurred) indicates there are UXO or DMM on the surface of the MRS.	**25**
Confirmed subsurface, active	◆ Physical evidence indicates the presence of UXO or DMM in the subsurface of the MRS, and the geological conditions at the MRS are likely to cause UXO or DMM to be exposed, in the future, by naturally occurring phenomena (e.g., drought, flooding, erosion, frost heave, tidal action), or intrusive activities (e.g., plowing, construction, dredging) at the MRS are likely to expose UXO or DMM. ◆ Historical evidence indicates that UXO or DMM are located in the subsurface of the MRS and the geological conditions at the MRS are likely to cause UXO or DMM to be exposed, in the future, by naturally occurring phenomena (e.g., drought, flooding, erosion, frost heave, tidal action), or intrusive activities (e.g., plowing, construction, dredging) at the MRS are likely to expose UXO or DMM.	20
Confirmed subsurface, stable	◆ Physical evidence indicates the presence of UXO or DMM in the subsurface of the MRS and the geological conditions at the MRS are not likely to cause UXO or DMM to be exposed, in the future, by naturally occurring phenomena, or intrusive activities at the MRS are not likely to cause UXO or DMM to be exposed. ◆ Historical evidence indicates that UXO or DMM are located in the subsurface of the MRS and the geological conditions at the MRS are not likely to cause UXO or DMM to be exposed, in the future, by naturally occurring phenomena, or intrusive activities at the MRS are not likely to cause UXO or DMM to be exposed.	15
Suspected (physical evidence)	◆ There is physical evidence (e.g., munitions debris such as fragments, penetrators, projectiles, shell casings, links, fins), other than the documented presence of UXO or DMM, indicating that UXO or DMM may be present at the MRS.	10
Suspected (historical evidence)	◆ There is historical evidence indicating that UXO or DMM may be present at the MRS.	**5**
Subsurface, physical constraint	◆ There is physical or historical evidence indicating that UXO or DMM may be present in the subsurface, but there is a physical constraint (e.g., pavement, water depth over 120 feet) preventing direct access to the UXO or DMM.	2
Small arms (regardless of location)	◆ The presence of small arms ammunition is confirmed or suspected, regardless of other factors such as geological stability. (There must be evidence that no other types of munitions [e.g., grenades] were used or are present at the MRS to place an MRS into this category.)	1
Evidence of no munitions	◆ Following investigation of the MRS, there is physical evidence that there are no UXO or DMM present, or there is historical evidence indicating that no UXO or DMM are present.	0
LOCATION OF MUNITIONS	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 25).	**25**

DIRECTIONS: Document any MRS-specific data used in selecting the ***Location of Munitions*** classifications in the space provided.

Confirmed subsurface was chosen, because numerous EOD calls involving C-4 plastic explosives (secondary explosives), M-222 Dragon high explosive anti-tank guided missile, M-7 grenades (riot control agent), and MK-2 fragmentation hand grenades were reported on this site. (CS Report, Section 4.2.1)

Table 4

EHE Module: Ease of Access Data Element Table

DIRECTIONS: Below are four classifications of barrier types that can surround an MRS and their descriptions. The barrier type is directly related to the ease of public access to the MRS. Circle the score that corresponds with the ease of access to the MRS.

Note: The term *barrier* is defined in Appendix C of the Primer.

Classification	Description	Score
No barrier	◆ There is no barrier preventing access to any part of the MRS (i.e., all parts of the MRS are accessible).	10
Barrier to MRS access is incomplete	◆ There is a barrier preventing access to parts of the MRS, but not the entire MRS.	8
Barrier to MRS access is complete but not monitored	◆ There is a barrier preventing access to all parts of the MRS, but there is no surveillance (e.g., by a guard) to ensure that the barrier is effectively preventing access to all parts of the MRS.	5
Barrier to MRS access is complete and monitored	◆ There is a barrier preventing access to all parts of the MRS, and there is active, continual surveillance (e.g., by a guard, video monitoring) to ensure that the barrier is effectively preventing access to all parts of the MRS.	**0**
EASE OF ACCESS	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 10).	**0**

DIRECTIONS: Document any MRS-specific data used in selecting the ***Ease of Access*** classification in the space provided.

The majority of FTSW is currently not fenced. Therefore, people can potentially access FTSW through many of the boundaries that are not fenced. This MRS is protected by fences and guards it is currently the Ammunition Supply Point.

Table 5

EHE Module: Status of Property Data Element Table

DIRECTIONS: Below are three classifications of the status of a property within the Department of Defense (DoD) and their descriptions. Circle the score that corresponds with the status of property at the MRS.

Classification	Description	Score
Non-DoD control	◆ The MRS is at a location that is no longer owned by, leased to, or otherwise possessed or used by DoD. Examples are privately owned land or water bodies; land or water bodies owned or controlled by state, tribal, or local governments; and land or water bodies managed by other federal agencies. ◆ The MRS is at a location that is owned by DoD, but that DoD has leased to another entity and for which DoD does not control access 24 hours per day.	5
Scheduled for transfer from DoD control	◆ The MRS is on land or is a water body that is owned, leased, or otherwise possessed by DoD, and DoD plans to transfer that land or water body to the control of another entity (e.g., a state, tribal, or local government; a private party; another federal agency) within 3 years from the date the Protocol is applied.	3
DoD control	◆ The MRS is on land or is a water body that is owned, leased, or otherwise possessed by DoD. With respect to property that is leased or otherwise possessed, DoD must control access to the MRS 24 hours per day, every day of the calendar year.	**0**
STATUS OF PROPERTY	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 5).	**0**

DIRECTIONS: Document any MRS-specific data used in selecting the ***Status of Property*** classification in the space provided.

This FTSW property is owned by the DoD.

Table 6

EHE Module: Population Density Data Element Table

DIRECTIONS: Below are three classifications for population density and their descriptions. Determine the population density per square mile that most closely corresponds with the population of the MRS, including the area within a two-mile radius of the MRS's perimeter. Circle the most appropriate score.

Note: Use the U.S. Census Bureau tract data available to capture the **highest** population density within a two-mile radius of the perimeter of the MRS.

Classification	Description	Score
> 500 persons per square mile	◆ There are more than 500 persons per square mile in the U.S. Census Bureau tract in which the MRS is located.	5
100–500 persons per square mile	◆ There are 100 to 500 persons per square mile in the U.S. Census Bureau tract in which the MRS is located.	**3**
< 100 persons per square mile	◆ There are fewer than 100 persons per square mile in the U.S. Census Bureau tract in which the MRS is located.	1
POPULATION DENSITY	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 5).	**3**

DIRECTIONS: Document any MRS-specific data used in selecting the ***Population Density*** classification in the space provided.

According to the 2000 U.S. Census, there are 118.7 persons per square mile in Liberty County, GA. (CS Report. Section 4.2.4.3.7)

Table 7

EHE Module: Population Near Hazard Data Element Table

DIRECTIONS: Below are six classifications describing the number of inhabited structures near the MRS. The number of inhabited buildings relates to the potential population near the MRS. Determine the number of inhabited structures within two miles of the MRS boundary and circle the score that corresponds with the number of inhabited structures.

Note: The term *inhabited structures* is defined in Appendix C of the Primer.

Classification	Description	Score
26 or more inhabited structures	◆ There are 26 or more inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	**5**
16 to 25 inhabited structures	◆ There are 16 to 25 inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	4
11 to 15 inhabited structures	◆ There are 11 to 15 inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	3
6 to 10 inhabited structures	◆ There are 6 to 10 inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	2
1 to 5 inhabited structures	◆ There are 1 to 5 inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	**1**
0 inhabited structures	◆ There are no inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	0
POPULATION NEAR HAZARD	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 5).	**5**

DIRECTIONS: Document any MRS-specific data used in selecting the ***Population Near Hazard*** classification in the space provided.

Military offices and an ammunition supply shed are in close proximity to the MRS. (CS Report, Section 4.2.4.3.1)

Table 8

EHE Module: Types of Activities/Structures Data Element Table

DIRECTIONS: Below are five classifications of activities and/or inhabited structures and their descriptions. Review the types of activities that occur and/or structures that are present within two miles of the MRS and circle the scores that correspond with **all** the activities/structure classifications at the MRS.

Note: The term *inhabited structure* is defined in Appendix C of the Primer.

Classification	Description	Score
Residential, educational, commercial, or subsistence	◆ Activities are conducted, or inhabited structures are located up to two miles from the MRS's boundary or within the MRS's boundary, that are associated with any of the following purposes: residential, educational, child care, critical assets (e.g., hospitals, fire and rescue, police stations, dams), hotels, commercial, shopping centers, playgrounds, community gathering areas, religious sites, or sites used for subsistence hunting, fishing, and gathering.	**5**
Parks and recreational areas	◆ Activities are conducted, or inhabited structures are located up to two miles from the MRS's boundary or within the MRS's boundary, that are associated with parks, nature preserves, or other recreational uses.	4
Agricultural, forestry	◆ Activities are conducted, or inhabited structures are located up to two miles from the MRS's boundary or within the MRS's boundary, that are associated with agriculture or forestry.	3
Industrial or warehousing	◆ Activities are conducted, or inhabited structures are located up to two miles from the MRS's boundary or within the MRS's boundary, that are associated with industrial activities or warehousing.	2
No known or recurring activities	◆ There are no known or recurring activities occurring up to two miles from the MRS's boundary or within the MRS's boundary.	1
TYPES OF ACTIVITIES/STRUCTURES	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 5).	**5**

DIRECTIONS: Document any MRS-specific data used in selecting the ***Types of Activities/Structures*** classifications in the space provided.

Military offices and an ammunition supply shed are in close proximity to the MRS. (CS Report, Section 4.2.4.3.1)

Table 9

EHE Module: Ecological and/or Cultural Resources Data Element Table

DIRECTIONS: Below are four classifications of ecological and/or cultural resources and their descriptions. Review the types of resources present and circle the score that corresponds with the ecological and/or cultural resources present on the MRS.

Note: The terms *ecological resources* and *cultural resources* are defined in Appendix C of the Primer.

Classification	Description	Score
Ecological and cultural resources present	◆ There are both ecological and cultural resources present on the MRS.	5
Ecological resources present	◆ There are ecological resources present on the MRS.	3
Cultural resources present	◆ There are cultural resources present on the MRS.	3
No ecological or cultural resources present	◆ There are no ecological resources or cultural resources present on the MRS.	**0**
ECOLOGICAL AND/OR CULTURAL RESOURCES	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 5).	**0**

DIRECTIONS: Document any MRS-specific data used in selecting the ***Ecological and/or Cultural Resources*** classification in the space provided.

The MRS is heavily developed and contains no ecological resources. There are no known cultural resources. (CS Report, Section 4.2.4.4.3)

Table 10
Determining the EHE Module Rating

DIRECTIONS:

1. From Tables 1–9, record the data element scores in the **Score** boxes to the right.
2. Add the **Score** boxes for each of the three factors and record this number in the **Value** boxes to the right.
3. Add the three **Value** boxes and record this number in the **EHE Module Total** box below.
4. Circle the appropriate range for the **EHE Module Total** below.
5. Circle the **EHE Module Rating** that corresponds to the range selected and record this value in the **EHE Module Rating** box found at the bottom of the table.

Note:
An alternative module rating may be assigned when a module letter rating is inappropriate. An alternative module rating is used when more information is needed to score one or more data elements, contamination at an MRS was previously addressed, or there is no reason to suspect contamination was ever present at an MRS.

	Source	Score	Value
Explosive Hazard Factor Data Elements			
Munitions Type	Table 1	30	40
Source of Hazard	Table 2	10	
Accessibility Factor Data Elements			
Location of Munitions	Table 3	25	25
Ease of Access	Table 4	0	
Status of Property	Table 5	0	
Receptor Factor Data Elements			
Population Density	Table 6	3	13
Population Near Hazard	Table 7	5	
Types of Activities/Structures	Table 8	5	
Ecological and/or Cultural Resources	Table 9	0	
EHE MODULE TOTAL			78

EHE Module Total	EHE Module Rating
92 to 100	A
82 to 91	B
71 to 81	**C**
60 to 70	D
48 to 59	E
38 to 47	F
less than 38	G
Alternative Module Ratings	Evaluation Pending
	No Longer Required
	No Known or Suspected Explosive Hazard
EHE MODULE RATING	**C**

Table 11

CHE Module: CWM Configuration Data Element Table

DIRECTIONS: Below are seven classifications of CWM configuration and their descriptions. Circle the scores that correspond with **all** the CWM configurations known or suspected to be present at the MRS.

Note: The terms *CWM/UXO, CWM/DMM, physical evidence,* and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Score
CWM, that are either UXO, or explosively configured damaged DMM	The CWM known or suspected of being present at the MRS are: ◆ CWM that are UXO (i.e., CWM/UXO) ◆ Explosively configured CWM that are DMM (i.e., CWM/DMM) that have been damaged.	30
CWM mixed with UXO	◆ The CWM known or suspected of being present at the MRS are undamaged CWM/DMM or CWM not configured as a munition that are commingled with conventional munitions that are UXO.	25
CWM, explosive configuration that are undamaged DMM	◆ The CWM known or suspected of being present at the MRS are explosively configured CWM/DMM that have not been damaged.	20
CWM/DMM, not explosively configured or CWM, bulk container	The CWM known or suspected of being present at the MRS are: ◆ Nonexplosively configured CWM/DMM either damaged or undamaged ◆ Bulk CWM (e.g., ton container).	15
CAIS K941 and CAIS K942	◆ The CWM/DMM known or suspected of being present at the MRS are CAIS K941-toxic gas set M-1 or CAIS K942-toxic gas set M-2/E11.	12
CAIS (chemical agent identification sets)	◆ CAIS, other than CAIS K941 and K942, are known or suspected of being present at the MRS.	10
Evidence of no CWM	◆ Following investigation, the physical evidence indicates that CWM are not present at the MRS, or the historical evidence indicates that CWM are not present at the MRS.	**0**
CWM CONFIGURATION	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 30).	**0**

DIRECTIONS: Document any MRS-specific data used in selecting the ***CWM Configuration*** classifications in the space provided.

There is no historical or current evidence of CWM existing on this MRS.

Table 12

CHE Module: Sources of CWM Data Element Table

DIRECTIONS: Below are 11 sources of CWM hazards and their descriptions. Review these classifications and circle the scores that correspond with **all** the sources of CWM hazards known or suspected to be present at the MRS.

Note: The terms *CWM/UXO, CWM/DMM, CAIS/DMM, surface, subsurface, physical evidence,* and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Score
Live-fire involving CWM	◆ The MRS is a former military range that supported live-fire of explosively configured CWM and the CWM/UXO are known or suspected of being present on the surface or in the subsurface. ◆ The MRS is a former military range that supported live-fire with conventional munitions, and CWM/DMM are on the surface or in the subsurface commingled with conventional munitions that are UXO.	10
Damaged CWM/DMM surface or subsurface	◆ There are damaged CWM/DMM on the surface or in the subsurface at the MRS.	10
Undamaged CWM/DMM surface	◆ There are undamaged CWM/DMM on the surface at the MRS.	10
CAIS/DMM surface	◆ There are CAIS/DMM on the surface.	10
Undamaged CWM/DMM, subsurface	◆ There are undamaged CWM/DMM in the subsurface at the MRS.	5
CAIS/DMM subsurface	◆ There are CAIS/DMM in the subsurface at the MRS.	5
Former CA or CWM Production Facilities	◆ The MRS is a facility that formerly engaged in production of CA or CWM, and CWM/DMM is suspected of being present on the surface or in the subsurface.	3
Former Research, Development, Testing, and Evaluation (RDT&E) facility using CWM	◆ The MRS is at a facility that formerly was involved in non-live-fire RDT&E activities (including static testing) involving CWM, and there are CWM/DMM suspected of being present on the surface or in the subsurface.	3
Former Training Facility using CWM or CAIS	◆ The MRS is a location that formerly was involved in training activities involving CWM and/or CAIS (e.g., training in recognition of CWM, decontamination training) and CWM/DMM or CAIS/DMM are suspected of being present on the surface or in the subsurface.	2
Former Storage or Transfer points of CWM	◆ The MRS is a former storage facility or transfer point (e.g., intermodal transfer) for CWM.	1
Evidence of no CWM	◆ Following investigation, the physical evidence indicates that CWM are not present at the MRS, or the historical evidence indicates that CWM are not present at the MRS.	**0**
SOURCES OF CWM	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 10).	**0**

DIRECTIONS: Document any MRS-specific data used in selecting the ***Sources of CWM*** classifications in the space provided.

There is no historical or current evidence of CWM existing on this MRS.

Table 13

CHE Module: Location of CWM Data Element Table

DIRECTIONS: Below are seven classifications of CWM locations and their descriptions. Review these locations and circle the scores that correspond with **all** the locations where CWM are known or suspected of being found at the MRS.

Note: The terms *confirmed, surface, subsurface, physical evidence,* and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Score
Confirmed surface	◆ Physical evidence indicates that there are CWM on the surface of the MRS. ◆ Historical evidence (i.e., a confirmed report such as an explosive ordnance disposal [EOD], police, or fire department report, that an incident or accident that involved CWM, regardless of configuration, occurred) indicates there are CWM on the surface of the MRS.	25
Confirmed subsurface, active	◆ Physical evidence indicates the presence of CWM in the subsurface of the MRS and the geological conditions at the MRS are likely to cause CWM to be exposed, in the future, by naturally occurring phenomena (e.g., drought, flooding, erosion, frost heave, tidal action), or intrusive activities (e.g., plowing, construction, dredging) at the MRS are likely to expose CWM. ◆ Historical evidence indicates that CWM are located in the subsurface of the MRS and the geological conditions at the MRS are likely to cause CWM to be exposed, in the future, by naturally occurring phenomena (e.g., drought, flooding, erosion, frost heave, tidal action), or intrusive activities (e.g., plowing, construction, dredging) at the MRS are likely to expose CWM.	20
Confirmed subsurface, stable	◆ Physical evidence indicates the presence of CWM in the subsurface of the MRS and the geological conditions at the MRS are not likely to cause CWM to be exposed, in the future, by naturally occurring phenomena, or intrusive activities at the MRS are not likely to cause CWM to be exposed. ◆ Historical evidence indicates that CWM are located in the subsurface of the MRS and the geological conditions at the MRS are not likely to cause CWM to be exposed, in the future, by naturally occurring phenomena, or intrusive activities at the MRS are not likely to cause CWM to be exposed.	15
Suspected (physical evidence)	◆ There is physical evidence, other than the documented presence of CWM, indicating that CWM may be present at the MRS.	10
Suspected (historical evidence)	◆ There is historical evidence indicating that CWM may be present at the MRS.	5
Subsurface, physical constraint	◆ There is physical or historical evidence indicating that CWM may be present in the subsurface, but there is a physical constraint (e.g., pavement, water depth over 120 feet) preventing direct access to the CWM.	2
Evidence of no CWM	◆ Following investigation of the MRS, there is physical evidence that there is no CWM present or there is historical evidence indicating that no CWM are present.	**<u>0</u>**
LOCATION OF CWM	**DIRECTIONS:** Record **<u>the single highest score</u>** from above in the box to the right (maximum score = 25).	**<u>0</u>**

DIRECTIONS: Document any MRS-specific data used in selecting the ***Location of CWM*** classifications in the space provided.

There is no historical or current evidence of CWM existing on this MRS.

Table 14-19 **CHE Module**
Because there is no historical or current evidence of CWM existing on this MRS, Tables 14-19 have been omitted according to Active-Army Guidance.

Table 20

Determining the CHE Module Rating

DIRECTIONS:

1. From Tables 11–19, record the data element scores in the **Score** boxes to the right.
2. Add the **Score** boxes for each of the three factors and record this number in the **Value** boxes to the right.
3. Add the three **Value** boxes and record this number in the **CHE Module Total** box below.
4. Circle the appropriate range for the **CHE Module Total** below.
5. Circle the **CHE Module Rating** that corresponds to the range selected and record this value in the **CHE Module Rating** box found at the bottom of the table.

Note:
An alternative module rating may be assigned when a module letter rating is inappropriate. An alternative module rating is used when more information is needed to score one or more data elements, contamination at an MRS was previously addressed, or there is no reason to suspect contamination was ever present at an MRS.

	Source	Score	Value
CWM Hazard Factor Data Elements			
CWM Configuration	Table 11	0	0
Sources of CWM	Table 12	0	
Accessibility Factor Data Elements			
Location of CWM	Table 13	0	-
Ease of Access	Table 14	-	
Status of Property	Table 15	-	
Receptor Factor Data Elements			
Population Density	Table 16	-	-
Population Near Hazard	Table 17	-	
Types of Activities/Structures	Table 18	-	
Ecological and/or Cultural Resources	Table 19	-	
CHE MODULE TOTAL			-

CHE Module Total	CHE Module Rating
92 to 100	A
82 to 91	B
71 to 81	C
60 to 70	D
48 to 59	E
38 to 47	F
less than 38	G
Alternative Module Ratings	Evaluation Pending
	No Longer Required
	No Known or Suspected CWM Hazard
CHE MODULE RATING	No Known or Suspected CWM Hazard

Table 21

HHE Module: Groundwater Data Element Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's groundwater and their **comparison values** (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the contaminant **ratios** together, including any additional groundwater contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard present in the groundwater, select the box at the bottom of the table.

Contaminant	Maximum Concentration (μg/L)	Comparison Value (μg/L)	Ratios
No groundwater samples collected.			
CHF Scale	**CHF Value**	**Sum The Ratios**	
CHF > 100	**H (High)**	$CHF = \sum \frac{[\text{Maximum Concentration of Contaminant}]}{[\text{Comparison Value for Contaminant}]}$	
100 > CHF > 2	**M (Medium)**		
2 > CHF	**L (Low)**		
CONTAMINANT HAZARD FACTOR	**DIRECTIONS:** Record **<u>the CHF Value</u>** from above in the box to the right (maximum value = H).		

Migratory Pathway Factor

DIRECTIONS: Circle the value that corresponds most closely to the groundwater migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the groundwater is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in groundwater has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the groundwater to a potential point of exposure (possibly due to the presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	**DIRECTIONS:** Record **<u>the single highest value</u>** from above in the box to the right (maximum value = H).	

Receptor Factor

DIRECTIONS: Circle the value that corresponds most closely to the groundwater receptors at the MRS.

Classification	Description	Value
Identified	There is a threatened water supply well downgradient of the source and the groundwater is a current source of drinking water or source of water for other beneficial uses such as irrigation/agriculture (equivalent to Class I or IIA aquifer).	H
Potential	There is no threatened water supply well downgradient of the source and the groundwater is currently or potentially usable for drinking water, irrigation, or agriculture (equivalent to Class I, IIA, or IIB aquifer).	M
Limited	There is no potentially threatened water supply well downgradient of the source and the groundwater is not considered a potential source of drinking water and is of limited beneficial use (equivalent to Class IIIA or IIIB aquifer, or where perched aquifer exists only).	L
RECEPTOR FACTOR	**DIRECTIONS:** Record **<u>the single highest value</u>** from above in the box to the right (maximum value = H).	

Table 21

HHE Module: Groundwater Data Element Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's groundwater and their **comparison values** (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the contaminant **ratios** together, including any additional groundwater contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard present in the groundwater, select the box at the bottom of the table.

Contaminant	Maximum Concentration (μg/L)	Comparison Value (μg/L)	Ratios
		No Known or Suspected Groundwater MC Hazard	X

Table 22

HHE Module: Surface Water – Human Endpoint Data Element Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's surface water and their **comparison values** (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the contaminant **ratios** together, including any additional surface water contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard with human endpoints present in the surface water, select the box at the bottom of the table.

Contaminant	Maximum Concentration (μg/L)	Comparison Value (μg/L)	Ratios
No surface water samples collected.			
CHF Scale	**CHF Value**	**Sum The Ratios**	
CHF > 100	**H (High)**	$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
100 > CHF > 2	**M (Medium)**		
2 > CHF	**L (Low)**		
CONTAMINANT HAZARD FACTOR	**DIRECTIONS:** Record **the CHF Value** from above in the box to the right (maximum value = H).		

Migratory Pathway Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface water migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the surface water is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in surface water has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the surface water to a potential point of exposure (possibly due to the presence of geological structures or physical controls).	L

Table 22

HHE Module: Surface Water – Human Endpoint Data Element Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's surface water and their **comparison values** (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the contaminant **ratios** together, including any additional surface water contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard with human endpoints present in the surface water, select the box at the bottom of the table.

Contaminant	Maximum Concentration (μg/L)	Comparison Value (μg/L)	Ratios
MIGRATORY PATHWAY FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).		

Receptor Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface water receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to surface water to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to surface water to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to surface water to which contamination has moved or can move.	L
RECEPTOR FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	

No Known or Suspected Surface Water (Human Endpoint) MC Hazard	X

Table 23

HHE Module: Sediment – Human Endpoint Data Element Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's sediment and their **comparison values** (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the contaminant **ratios** together, including any additional sediment contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard with human endpoints present in the sediment, select the box at the bottom of the table.

Contaminant	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratios
No sediment samples collected.			
CHF Scale	**CHF Value**	**Sum The Ratios**	
CHF > 100	**H (High)**		
100 > CHF > 2	**M (Medium)**		

$$CHF = \sum \frac{[\text{Maximum Concentration of Contaminant}]}{[\text{Comparison Value for Contaminant}]}$$

Table 23

HHE Module: Sediment – Human Endpoint Data Element Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's sediment and their **comparison values** (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the contaminant **ratios** together, including any additional sediment contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard with human endpoints present in the sediment, select the box at the bottom of the table.

Contaminant	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratios
2 > CHF	L (Low)		

CONTAMINANT HAZARD FACTOR	**DIRECTIONS:** Record **the CHF Value** from above in the box to the right maximum value = H).	

Migratory Pathway Factor

DIRECTIONS: Circle the value that corresponds most closely to the sediment migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the sediment is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in sediment has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the sediment to a potential point of exposure (possibly due to the presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	

Receptor Factor

DIRECTIONS: Circle the value that corresponds most closely to the sediment receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to sediment to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to sediment to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to sediment to which contamination has moved or can move.	L
RECEPTOR FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	

No Known or Suspected Sediment (Human Endpoint) MC Hazard X

Table 24

HHE Module: Surface Water – Ecological Endpoint Data Element Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's surface water and their **comparison values** (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the contaminant **ratios** together, including any additional surface water contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard with ecological endpoints present in the surface water, select the box at the bottom of the table.

Contaminant	Maximum Concentration (μg/L)	Comparison Value (μg/L)	Ratios
No surface water samples collected.			
CHF Scale	**CHF Value**	**Sum the Ratios**	
CHF > 100	**H (High)**	$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
100 > CHF > 2	**M (Medium)**		
2 > CHF	**L (Low)**		
CONTAMINANT HAZARD FACTOR	**DIRECTIONS:** Record **the CHF Value** from above in the box to the right (maximum value = H).		

Migratory Pathway Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface water migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the surface water is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in surface water has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the surface water to a potential point of exposure (possibly due to the presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	

Receptor Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface water receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to surface water to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to surface water to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to surface water to which contamination has moved or can move.	L
RECEPTOR FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	

No Known or Suspected Surface Water (Ecological Endpoint) MC Hazard	X

Table 25

HHE Module: Sediment – Ecological Endpoint Data Element Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's sediment and their **comparison values** (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the contaminant **ratios** together, including any additional sediment contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard with ecological endpoints present in the sediment, select the box at the bottom of the table.

.

Contaminant	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratios
No sediment samples collected.			
CHF Scale	**CHF Value**	**Sum the Ratios**	
CHF > 100	**H (High)**		
100 > CHF > 2	**M (Medium)**		
2 > CHF	**L (Low)**		

$$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$$

CONTAMINANT HAZARD FACTOR	**DIRECTIONS:** Record **the CHF Value** from above in the box to the right (maximum value = H).	

Migratory Pathway Factor

DIRECTIONS: Circle the value that corresponds most closely to the sediment migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the sediment is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in sediment has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the sediment to a potential point of exposure (possibly due to the presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	

Receptor Factor

DIRECTIONS: Circle the value that corresponds most closely to the sediment receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to sediment to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to sediment to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to sediment to which contamination has moved or can move.	L
RECEPTOR FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	

No Known or Suspected Sediment (Ecological Endpoint) MC Hazard	X

Table 26

HHE Module: Surface Soil Data Element Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's surface soil and their **comparison values** (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the contaminant **ratios** together, including any additional surface soil contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard present in the surface soil, select the box at the bottom of the table.

.

Contaminant	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratio
Sampling conducted, no contaminants found.			
CHF Scale	**CHF Value**	**Sum the Ratios**	
CHF > 100	**H (High)**		
100 > CHF > 2	**M (Medium)**		
2 > CHF	**L (Low)**		

$$CHF = \sum \frac{[\text{Maximum Concentration of Contaminant}]}{[\text{Comparison Value for Contaminant}]}$$

CONTAMINANT HAZARD FACTOR	**DIRECTIONS:** Record **the CHF Value** from above in the box to the right (maximum value = H).	

Migratory Pathway Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface soil migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the surface soil is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in surface soil has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the surface soil to a potential point of exposure (possibly due to the presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	

Receptor Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface soil receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to surface soil to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to surface soil to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to surface soil to which contamination has moved or can move.	L
RECEPTOR FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	

No Known or Suspected Surface Soil MC Hazard X

Table 27

HHE Module: Supplemental Contaminant Hazard Factor Table

<u>**Contaminant Hazard Factor (CHF)**</u>

DIRECTIONS: Only use this table if there are more than five contaminants in any given medium present at the MRS. This is a supplemental table designed to hold information about contaminants that do not fit in the previous tables. Indicate the **media** in which these contaminants are present. Then record all **contaminants**, their **maximum concentrations** and their **comparison values** (from Appendix B of the Primer) in the table below. Calculate and record the **ratio** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** for each medium on the appropriate media-specific tables.

Note: Do not add ratios from different media.

Media	Contaminant	Maximum Concentration	Comparison Value	Ratio

Table 28

Determining the HHE Module Rating

DIRECTIONS:

1. Record the letter values (H, M, L) for the **Contaminant Hazard**, **Migration Pathway**, and **Receptor Factors** for the media (from Tables 21–26) in the corresponding boxes below.
2. Record the media's three-letter combinations in the **Three-Letter Combination** boxes below (three-letter combinations are arranged from Hs to Ms to Ls).
3. Using the **HHE Ratings** provided below, determine each media's rating (A–G) and record the letter in the corresponding **Media Rating** box below.

Media (Source)	Contaminant Hazard Factor Value	Migratory Pathway Factor Value	Receptor Factor Value	Three-Letter Combination (Hs-Ms-Ls)	Media Rating (A-G)
Groundwater (Table 21)					
Surface Water/Human Endpoint (Table 22)					
Sediment/Human Endpoint (Table 23)					
Surface Water/Ecological Endpoint (Table 24)					
Sediment/Ecological Endpoint (Table 25)					
Surface Soil (Table 26)					

DIRECTIONS (cont.):

4. Select the single highest Media Rating (A is highest; G is lowest) and enter the letter in the **HHE Module Rating** box.

Note:
An alternative module rating may be assigned when a module letter rating is inappropriate. An alternative module rating is used when more information is needed to score one or more media, contamination at an MRS was previously addressed, or there is no reason to suspect contamination was ever present at an MRS.

HHE MODULE RATING	

HHE Ratings (for reference only)

Combination	Rating
HHH	A
HHM	B
HHL	C
HMM	C
HML	D
MMM	D
HLL	E
MML	E
MLL	F
LLL	G
Alternative Module Ratings	Evaluation Pending
	No Longer Required
	No Known or Suspected MC Hazard

Table 29

MRS Priority

DIRECTIONS: In the chart below, circle the letter **rating** for each module recorded in Table 10 (EHE), Table 20 (CHE), and Table 28 (HHE). Circle the corresponding numerical **priority** for each module. If information to determine the module rating is not available, choose the appropriate alternative module rating. The MRS Priority is the single highest priority; record this relative priority in the **MRS Priority or Alternative MRS Rating** at the bottom of the table.

Note: An MRS assigned Priority 1 has the highest relative priority; an MRS assigned Priority 8 has the lowest relative priority. Only an MRS with CWM known or suspected to be present can be assigned Priority 1; an MRS that has CWM known or suspected to be present cannot be assigned Priority 8.

EHE Rating	Priority	CHE Rating	Priority	HHE Rating	Priority
		A	**1**		
A	**2**	**B**	**2**	**A**	**2**
B	**3**	**C**	**3**	**B**	**3**
C	**4**	**D**	**4**	**C**	**4**
D	**5**	**E**	**5**	**D**	**5**
E	**6**	**F**	**6**	E	6
F	**7**	**G**	**7**	**F**	**7**
G	**8**			**G**	**8**
Evaluation Pending		Evaluation Pending		Evaluation Pending	
No Longer Required		No Longer Required		No Longer Required	
No Known or Suspected Explosive Hazard		**No Known or Suspected CWM Hazard**		**No Known or Suspected MC Hazard**	
MRS PRIORITY or ALTERNATIVE MRS RATING				4	

Table A
MRS Background Information

DIRECTIONS: Record the background information below for the MRS to be evaluated. Much of this information is available from Service and DoD databases. If the MRS is located on a FUDS property, the suitable FUDS property information should be substituted. In the **MRS Summary**, briefly describe the UXO, DMM, or MC that are known or suspected to be present, the exposure setting (the MRS's physical environment), any other incidental nonmunitions-related contaminants (e.g., benzene, trichloroethylene) found at the MRS, and any potentially exposed human and ecological receptors. If possible, include a map of the MRS.

Munitions Response Site Name: **Small Arms Range 3 (FTSW-007-R-01)**

Component: **US Army**

Installation/Property Name: **Ft. Stewart**

Location (City, County, State): **Ft. Stewart, Liberty County, GA**

Site Name/Project Name (Project No.): **Ft. Stewart MRSPP SI (2118093)**

Date Information Entered/Updated: **July 24, 2007**

Point of Contact (Name/Phone): **Shelly Kolb, Malcolm Pirnie, Inc. / (410) 230-9958**

Project Phase (check only one):

❑ PA	✠ SI	❑ RI	❑ FS	❑ RD
❑ RA-C	❑ RIP	❑ RA-O	❑ RC	❑ LTM

Media Evaluated (check all that apply):

❑ Groundwater	❑ Sediment (human receptor)
✠ Surface soil	❑ Surface Water (ecological receptor)
❑ Sediment (ecological receptor)	❑ Surface Water (human receptor)

MRS Summary:

MRS Description: Describe the munitions-related activities that occurred at the installation, the dates of operation, and the UXO, DMM, or MC known or suspected to be present. When possible, identify munitions, CWM, and MC by type: The overlapping historical munitions use is a small arms range used in 1964. According to documents reviewed for the HRR, munitions used on the small arms range are believed to have been .50-cal or less; however, the exact caliber is unknown. No MEC or munitions debris was found.

Description of Pathways for Human and Ecological Receptors: Potentially complete pathways exist for authorized installation personnel, authorized contractors, and biota for MEC in the subsurface as these receptors have the potential to conduct intrusive activities. Potentially complete MC pathways for biota include game/fish/prey, surface soil, subsurface soil, and shallow groundwater.

Description of Receptors (Human and Ecological): The current human receptors of the Small Arms Range 3 are authorized installation personnel, contractors, and trespassers. There are a variety of species at this site.

Table 1

EHE Module: Munitions Type Data Element Table

DIRECTIONS: Below are 11 classifications of munitions and their descriptions. Circle the scores that correspond with **all** the munitions types known or suspected to be present at the MRS.

Note: The terms *practice munitions, small arms ammunition, physical evidence,* and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Score
Sensitive	◆ UXO that are considered most likely to function upon any interaction with exposed persons (e.g., submunitions, 40mm high-explosive [HE] grenades, white phosphorus [WP] munitions, high-explosive antitank [HEAT] munitions, and practice munitions with sensitive fuzes, but excluding all other practice munitions). ◆ Hand grenades containing energetic filler. ◆ Bulk primary explosives, or mixtures of these with environmental media, such that the mixture poses an explosive hazard.	30
High explosive (used or damaged)	◆ UXO containing a high-explosive filler (e.g., RDX, Composition B), that are not considered "sensitive." ◆ DMM containing a high-explosive filler that have: ▪ Been damaged by burning or detonation ▪ Deteriorated to the point of instability.	25
Pyrotechnic (used or damaged)	◆ UXO containing a pyrotechnic filler other than white phosphorus (e.g., flares, signals, simulators, smoke grenades). ◆ DMM containing a pyrotechnic filler other than white phosphorus (e.g., flares, signals, simulators, smoke grenades) that have: ▪ Been damaged by burning or detonation ▪ Deteriorated to the point of instability.	20
High explosive (unused)	◆ DMM containing a high-explosive filler that: ▪ Have not been damaged by burning or detonation ▪ Are not deteriorated to the point of instability.	15
Propellant	◆ UXO containing mostly single-, double-, or triple-based propellant, or composite propellants (e.g., a rocket motor). ◆ DMM containing mostly single-, double-, or triple-based propellant, or composite propellants (e.g., a rocket motor) that are: ▪ Damaged by burning or detonation ▪ Deteriorated to the point of instability.	15
Bulk secondary high explosives, pyrotechnics, or propellant	◆ DMM containing mostly single-, double-, or triple-based propellant, or composite propellants (e.g., a rocket motor). ◆ DMM that are bulk secondary high explosives, pyrotechnic compositions, or propellant (not contained in a munition), or mixtures of these with environmental media such that the mixture poses an explosive hazard.	10
Pyrotechnic (not used or damaged)	◆ DMM containing a pyrotechnic filler (i.e., red phosphorus), other than white phosphorus filler, that: ▪ Have not been damaged by burning or detonation ▪ Are not deteriorated to the point of instability.	10
Practice	◆ UXO that are practice munitions that are not associated with a sensitive fuze. ◆ DMM that are practice munitions that are not associated with a sensitive fuze and that have not: ▪ Been damaged by burning or detonation ▪ Deteriorated to the point of instability.	5
Riot control	◆ UXO or DMM containing a riot control agent filler (e.g., tear gas).	3
Small arms	◆ Used munitions or DMM that are categorized as small arms ammunition. (Physical evidence or historical evidence that no other types of munitions [e.g., grenades, subcaliber training rockets, demolition charges] were used or are present on the MRS is required for selection of this category.)	2
Evidence of no munitions	◆ Following investigation of the MRS, there is physical evidence that there are no UXO or DMM present, or there is historical evidence indicating that no UXO or DMM are present.	**0**
MUNITIONS TYPE	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 30).	**0**

Table 1

EHE Module: Munitions Type Data Element Table

DIRECTIONS: Below are 11 classifications of munitions and their descriptions. Circle the scores that correspond with **all** the munitions types known or suspected to be present at the MRS.

Note: The terms *practice munitions, small arms ammunition, physical evidence,* and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Score

DIRECTIONS: Document any MRS-specific data used in selecting the ***Munitions Type*** classifications in the space provided.

According to information from the Phase 3 range inventory, only small arms were used at this MRS. According to documents reviewed for the HRR, munitions used on the small arms range were .50-cal or less; however, the exact caliber is unknown. (CS Report, Section 4.7.1)

Table 2

EHE Module: Source of Hazard Data Element Table

DIRECTIONS: Below are 11 classifications describing sources of explosive hazards. Circle the scores that correspond with **all** the sources of explosive hazards known or suspected to be present at the MRS.

Note: The terms *former range, practice munitions, small arms range, physical evidence,* and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Score
Former range	◆ The MRS is a former military range where munitions (including practice munitions with sensitive fuzes) have been used. Such areas include impact or target areas and associated buffer and safety zones.	10
Former munitions treatment (i.e., OB/OD) unit	◆ The MRS is a location where UXO or DMM (e.g., munitions, bulk explosives, bulk pyrotechnic, or bulk propellants) were burned or detonated for the purpose of treatment prior to disposal.	8
Former practice munitions range	◆ The MRS is a former military range on which only practice munitions without sensitive fuzes were used.	6
Former maneuver area	◆ The MRS is a former maneuver area where no munitions other than flares, simulators, smokes, and blanks were used. There must be evidence that no other munitions were used at the location to place an MRS into this category.	5
Former burial pit or other disposal area	◆ The MRS is a location where DMM were buried or disposed of (e.g., disposed of into a water body) without prior thermal treatment.	5
Former industrial operating facilities	◆ The MRS is a location that is a former munitions maintenance, manufacturing, or demilitarization facility.	4
Former firing points	◆ The MRS is a firing point, where the firing point is delineated as an MRS separate from the rest of a former military range.	4
Former missile or air defense artillery emplacements	◆ The MRS is a former missile defense or air defense artillery (ADA) emplacement not associated with a military range.	2
Former storage or transfer points	◆ The MRS is a location where munitions were stored or handled for transfer between different modes of transportation (e.g., rail to truck, truck to weapon system).	2
Former small arms range	◆ The MRS is a former military range where only small arms ammunition was used. (There must be evidence that no other types of munitions [e.g., grenades] were used or are present to place an MRS into this category.)	1
Evidence of no munitions	◆ Following investigation of the MRS, there is physical evidence that no UXO or DMM are present, or there is historical evidence indicating that no UXO or DMM are present.	**0**
SOURCE OF HAZARD	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 10).	**0**

DIRECTIONS: Document any MRS-specific data used in selecting the ***Source of Hazard*** classifications in the space provided.

No explosive hazard is expected at this site.

Table 3

EHE Module: Location of Munitions Data Element Table

DIRECTIONS: Below are eight classifications of munitions locations and their descriptions. Circle the scores that correspond with **all** the locations where munitions are known or suspected to be present at the MRS.

Note: The terms *confirmed, surface, subsurface, small arms ammunition, physical evidence,* and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Score
Confirmed surface	◆ Physical evidence indicates that there are UXO or DMM on the surface of the MRS. ◆ Historical evidence (i.e., a confirmed report such as an explosive ordnance disposal [EOD], police, or fire department report that an incident or accident that involved UXO or DMM occurred) indicates there are UXO or DMM on the surface of the MRS.	25
Confirmed subsurface, active	◆ Physical evidence indicates the presence of UXO or DMM in the subsurface of the MRS, and the geological conditions at the MRS are likely to cause UXO or DMM to be exposed, in the future, by naturally occurring phenomena (e.g., drought, flooding, erosion, frost heave, tidal action), or intrusive activities (e.g., plowing, construction, dredging) at the MRS are likely to expose UXO or DMM. ◆ Historical evidence indicates that UXO or DMM are located in the subsurface of the MRS and the geological conditions at the MRS are likely to cause UXO or DMM to be exposed, in the future, by naturally occurring phenomena (e.g., drought, flooding, erosion, frost heave, tidal action), or intrusive activities (e.g., plowing, construction, dredging) at the MRS are likely to expose UXO or DMM.	20
Confirmed subsurface, stable	◆ Physical evidence indicates the presence of UXO or DMM in the subsurface of the MRS and the geological conditions at the MRS are not likely to cause UXO or DMM to be exposed, in the future, by naturally occurring phenomena, or intrusive activities at the MRS are not likely to cause UXO or DMM to be exposed. ◆ Historical evidence indicates that UXO or DMM are located in the subsurface of the MRS and the geological conditions at the MRS are not likely to cause UXO or DMM to be exposed, in the future, by naturally occurring phenomena, or intrusive activities at the MRS are not likely to cause UXO or DMM to be exposed.	15
Suspected (physical evidence)	◆ There is physical evidence (e.g., munitions debris such as fragments, penetrators, projectiles, shell casings, links, fins), other than the documented presence of UXO or DMM, indicating that UXO or DMM may be present at the MRS.	10
Suspected (historical evidence)	◆ There is historical evidence indicating that UXO or DMM may be present at the MRS.	5
Subsurface, physical constraint	◆ There is physical or historical evidence indicating that UXO or DMM may be present in the subsurface, but there is a physical constraint (e.g., pavement, water depth over 120 feet) preventing direct access to the UXO or DMM.	2
Small arms (regardless of location)	◆ The presence of small arms ammunition is confirmed or suspected, regardless of other factors such as geological stability. (There must be evidence that no other types of munitions [e.g., grenades] were used or are present at the MRS to place an MRS into this category.)	1
Evidence of no munitions	◆ Following investigation of the MRS, there is physical evidence that there are no UXO or DMM present, or there is historical evidence indicating that no UXO or DMM are present.	**0**
LOCATION OF MUNITIONS	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 25).	**0**

DIRECTIONS: Document any MRS-specific data used in selecting the ***Location of Munitions*** classifications in the space provided.

No explosive hazard is expected at this site.

Table 4-9
EHE Module

Because only small arms were used at this site and no explosive hazard is expected, Tables 4-9 have been omitted according to Active-Army Guidance. (CS Report, Section 4.7.1)

Table 10

Determining the EHE Module Rating

DIRECTIONS:

1. From Tables 1–9, record the data element scores in the **Score** boxes to the right.
2. Add the **Score** boxes for each of the three factors and record this number in the **Value** boxes to the right.
3. Add the three **Value** boxes and record this number in the **EHE Module Total** box below.
4. Circle the appropriate range for the **EHE Module Total** below.
5. Circle the **EHE Module Rating** that corresponds to the range selected and record this value in the **EHE Module Rating** box found at the bottom of the table.

Note:
An alternative module rating may be assigned when a module letter rating is inappropriate. An alternative module rating is used when more information is needed to score one or more data elements, contamination at an MRS was previously addressed, or there is no reason to suspect contamination was ever present at an MRS.

	Source	Score	Value
Explosive Hazard Factor Data Elements			
Munitions Type	Table 1	0	0
Source of Hazard	Table 2	0	
Accessibility Factor Data Elements			
Location of Munitions	Table 3	0	-
Ease of Access	Table 4	-	
Status of Property	Table 5	-	
Receptor Factor Data Elements			
Population Density	Table 6	-	-
Population Near Hazard	Table 7	-	
Types of Activities/Structures	Table 8	-	
Ecological and/or Cultural Resources	Table 9	-	
EHE MODULE TOTAL			-

EHE Module Total	EHE Module Rating
92 to 100	A
82 to 91	B
71 to 81	C
60 to 70	D
48 to 59	E
38 to 47	F
less than 38	G
Alternative Module Ratings	Evaluation Pending
	No Longer Required
	No Known or Suspected Explosive Hazard
EHE MODULE RATING	**No Known or Suspected Explosive Hazard**

Table 11

CHE Module: CWM Configuration Data Element Table

DIRECTIONS: Below are seven classifications of CWM configuration and their descriptions. Circle the scores that correspond with **all** the CWM configurations known or suspected to be present at the MRS.

Note: The terms *CWM/UXO, CWM/DMM, physical evidence,* and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Score
CWM, that are either UXO, or explosively configured damaged DMM	The CWM known or suspected of being present at the MRS are: ◆ CWM that are UXO (i.e., CWM/UXO) ◆ Explosively configured CWM that are DMM (i.e., CWM/DMM) that have been damaged.	30
CWM mixed with UXO	◆ The CWM known or suspected of being present at the MRS are undamaged CWM/DMM or CWM not configured as a munition that are commingled with conventional munitions that are UXO.	25
CWM, explosive configuration that are undamaged DMM	◆ The CWM known or suspected of being present at the MRS are explosively configured CWM/DMM that have not been damaged.	20
CWM/DMM, not explosively configured or CWM, bulk container	The CWM known or suspected of being present at the MRS are: ◆ Nonexplosively configured CWM/DMM either damaged or undamaged ◆ Bulk CWM (e.g., ton container).	15
CAIS K941 and CAIS K942	◆ The CWM/DMM known or suspected of being present at the MRS are CAIS K941-toxic gas set M-1 or CAIS K942-toxic gas set M-2/E11.	12
CAIS (chemical agent identification sets)	◆ CAIS, other than CAIS K941 and K942, are known or suspected of being present at the MRS.	10
Evidence of no CWM	◆ Following investigation, the physical evidence indicates that CWM are not present at the MRS, or the historical evidence indicates that CWM are not present at the MRS.	**0**
CWM CONFIGURATION	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 30).	**0**

DIRECTIONS: Document any MRS-specific data used in selecting the ***CWM Configuration*** classifications in the space provided.

Small arms are the only types of munitions used on this MRS. (CS Report , Section 4.7.1)

Table 12

CHE Module: Sources of CWM Data Element Table

DIRECTIONS: Below are 11 sources of CWM hazards and their descriptions. Review these classifications and circle the scores that correspond with **all** the sources of CWM hazards known or suspected to be present at the MRS.

Note: The terms *CWM/UXO, CWM/DMM, CAIS/DMM, surface, subsurface, physical evidence,* and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Score
Live-fire involving CWM	◆ The MRS is a former military range that supported live-fire of explosively configured CWM and the CWM/UXO are known or suspected of being present on the surface or in the subsurface. ◆ The MRS is a former military range that supported live-fire with conventional munitions, and CWM/DMM are on the surface or in the subsurface commingled with conventional munitions that are UXO.	10
Damaged CWM/DMM surface or subsurface	◆ There are damaged CWM/DMM on the surface or in the subsurface at the MRS.	10
Undamaged CWM/DMM surface	◆ There are undamaged CWM/DMM on the surface at the MRS.	10
CAIS/DMM surface	◆ There are CAIS/DMM on the surface.	10
Undamaged CWM/DMM, subsurface	◆ There are undamaged CWM/DMM in the subsurface at the MRS.	5
CAIS/DMM subsurface	◆ There are CAIS/DMM in the subsurface at the MRS.	5
Former CA or CWM Production Facilities	◆ The MRS is a facility that formerly engaged in production of CA or CWM, and CWM/DMM is suspected of being present on the surface or in the subsurface.	3
Former Research, Development, Testing, and Evaluation (RDT&E) facility using CWM	◆ The MRS is at a facility that formerly was involved in non-live-fire RDT&E activities (including static testing) involving CWM, and there are CWM/DMM suspected of being present on the surface or in the subsurface.	3
Former Training Facility using CWM or CAIS	◆ The MRS is a location that formerly was involved in training activities involving CWM and/or CAIS (e.g., training in recognition of CWM, decontamination training) and CWM/DMM or CAIS/DMM are suspected of being present on the surface or in the subsurface.	2
Former Storage or Transfer points of CWM	◆ The MRS is a former storage facility or transfer point (e.g., intermodal transfer) for CWM.	1
Evidence of no CWM	◆ Following investigation, the physical evidence indicates that CWM are not present at the MRS, or the historical evidence indicates that CWM are not present at the MRS.	**0**
SOURCES OF CWM	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 10).	**0**

DIRECTIONS: Document any MRS-specific data used in selecting the ***Sources of CWM*** classifications in the space provided.

There is no historical or current evidence of CWM existing on this MRS.

Table 13

CHE Module: Location of CWM Data Element Table

DIRECTIONS: Below are seven classifications of CWM locations and their descriptions. Review these locations and circle the scores that correspond with **all** the locations where CWM are known or suspected of being found at the MRS.

Note: The terms *confirmed, surface, subsurface, physical evidence,* and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Score
Confirmed surface	◆ Physical evidence indicates that there are CWM on the surface of the MRS. ◆ Historical evidence (i.e., a confirmed report such as an explosive ordnance disposal [EOD], police, or fire department report, that an incident or accident that involved CWM, regardless of configuration, occurred) indicates there are CWM on the surface of the MRS.	25
Confirmed subsurface, active	◆ Physical evidence indicates the presence of CWM in the subsurface of the MRS and the geological conditions at the MRS are likely to cause CWM to be exposed, in the future, by naturally occurring phenomena (e.g., drought, flooding, erosion, frost heave, tidal action), or intrusive activities (e.g., plowing, construction, dredging) at the MRS are likely to expose CWM. ◆ Historical evidence indicates that CWM are located in the subsurface of the MRS and the geological conditions at the MRS are likely to cause CWM to be exposed, in the future, by naturally occurring phenomena (e.g., drought, flooding, erosion, frost heave, tidal action), or intrusive activities (e.g., plowing, construction, dredging) at the MRS are likely to expose CWM.	20
Confirmed subsurface, stable	◆ Physical evidence indicates the presence of CWM in the subsurface of the MRS and the geological conditions at the MRS are not likely to cause CWM to be exposed, in the future, by naturally occurring phenomena, or intrusive activities at the MRS are not likely to cause CWM to be exposed. ◆ Historical evidence indicates that CWM are located in the subsurface of the MRS and the geological conditions at the MRS are not likely to cause CWM to be exposed, in the future, by naturally occurring phenomena, or intrusive activities at the MRS are not likely to cause CWM to be exposed.	15
Suspected (physical evidence)	◆ There is physical evidence, other than the documented presence of CWM, indicating that CWM may be present at the MRS.	10
Suspected (historical evidence)	◆ There is historical evidence indicating that CWM may be present at the MRS.	5
Subsurface, physical constraint	◆ There is physical or historical evidence indicating that CWM may be present in the subsurface, but there is a physical constraint (e.g., pavement, water depth over 120 feet) preventing direct access to the CWM.	2
Evidence of no CWM	◆ Following investigation of the MRS, there is physical evidence that there is no CWM present or there is historical evidence indicating that no CWM are present.	**0**
LOCATION OF CWM	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 25).	**0**

DIRECTIONS: Document any MRS-specific data used in selecting the ***Location of CWM*** classifications in the space provided.

There is no historical or current evidence of CWM existing on this MRS.

Tables 14-19

CHE Module: Sources of CWM Data Element Table

Because there is no historical or current evidence of CWM existing on this MRS, Tables 14-19 have been omitted according to Active-Army Guidance.

Table 20

Determining the CHE Module Rating

DIRECTIONS:

1. From Tables 11–19, record the data element scores in the **Score** boxes to the right.
2. Add the **Score** boxes for each of the three factors and record this number in the **Value** boxes to the right.
3. Add the three **Value** boxes and record this number in the **CHE Module Total** box below.
4. Circle the appropriate range for the **CHE Module Total** below.
5. Circle the **CHE Module Rating** that corresponds to the range selected and record this value in the **CHE Module Rating** box found at the bottom of the table.

Note:
An alternative module rating may be assigned when a module letter rating is inappropriate. An alternative module rating is used when more information is needed to score one or more data elements, contamination at an MRS was previously addressed, or there is no reason to suspect contamination was ever present at an MRS.

	Source	Score	Value
CWM Hazard Factor Data Elements			
CWM Configuration	Table 11	0	0
Sources of CWM	Table 12	0	
Accessibility Factor Data Elements			
Location of CWM	Table 13	0	-
Ease of Access	Table 14	-	
Status of Property	Table 15	-	
Receptor Factor Data Elements			
Population Density	Table 16	-	-
Population Near Hazard	Table 17	-	
Types of Activities/Structures	Table 18	-	
Ecological and/or Cultural Resources	Table 19	-	
CHE MODULE TOTAL			-

CHE Module Total	CHE Module Rating
92 to 100	A
82 to 91	B
71 to 81	C
60 to 70	D
48 to 59	E
38 to 47	F
less than 38	G
Alternative Module Ratings	Evaluation Pending
	No Longer Required
	No Known or Suspected CWM Hazard
CHE MODULE RATING	**No Known or Suspected CWM Hazard**

Table 21

HHE Module: Groundwater Data Element Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's groundwater and their **comparison values** (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the contaminant **ratios** together, including any additional groundwater contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard present in the groundwater, select the box at the bottom of the table.

Contaminant	Maximum Concentration (μg/L)	Comparison Value (μg/L)	Ratios
No groundwater samples collected.			
CHF Scale	**CHF Value**	**Sum The Ratios**	
CHF > 100	**H (High)**	$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
100 > CHF > 2	**M (Medium)**		
2 > CHF	**L (Low)**		
CONTAMINANT HAZARD FACTOR	**DIRECTIONS:** Record **the CHF Value** from above in the box to the right (maximum value = H).		

Migratory Pathway Factor

DIRECTIONS: Circle the value that corresponds most closely to the groundwater migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the groundwater is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in groundwater has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the groundwater to a potential point of exposure (possibly due to the presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	

Receptor Factor

DIRECTIONS: Circle the value that corresponds most closely to the groundwater receptors at the MRS.

Classification	Description	Value
Identified	There is a threatened water supply well downgradient of the source and the groundwater is a current source of drinking water or source of water for other beneficial uses such as irrigation/agriculture (equivalent to Class I or IIA aquifer).	H
Potential	There is no threatened water supply well downgradient of the source and the groundwater is currently or potentially usable for drinking water, irrigation, or agriculture (equivalent to Class I, IIA, or IIB aquifer).	M
Limited	There is no potentially threatened water supply well downgradient of the source and the groundwater is not considered a potential source of drinking water and is of limited beneficial use (equivalent to Class IIIA or IIIB aquifer, or where perched aquifer exists only).	L
RECEPTOR FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	

No Known or Suspected Groundwater MC Hazard X

Table 22

HHE Module: Surface Water – Human Endpoint Data Element Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's surface water and their **comparison values** (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the contaminant **ratios** together, including any additional surface water contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard with human endpoints present in the surface water, select the box at the bottom of the table.

Contaminant	Maximum Concentration (μg/L)	Comparison Value (μg/L)	Ratios
No surface water samples collected.			
CHF Scale	**CHF Value**	**Sum The Ratios**	
CHF > 100	**H (High)**	$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
100 > CHF > 2	**M (Medium)**		
2 > CHF	**L (Low)**		
CONTAMINANT HAZARD FACTOR	**DIRECTIONS:** Record **the CHF Value** from above in the box to the right (maximum value = H).		

Migratory Pathway Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface water migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the surface water is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in surface water has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the surface water to a potential point of exposure (possibly due to the presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	

Receptor Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface water receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to surface water to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to surface water to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to surface water to which contamination has moved or can move.	L
RECEPTOR FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	

No Known or Suspected Surface Water (Human Endpoint) MC Hazard	X

Table 23

HHE Module: Sediment – Human Endpoint Data Element Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's sediment and their **comparison values** (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the contaminant **ratios** together, including any additional sediment contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard with human endpoints present in the sediment, select the box at the bottom of the table.

Contaminant	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratios
No sediment samples collected.			
CHF Scale	**CHF Value**	**Sum The Ratios**	
CHF > 100	**H (High)**	$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
100 > CHF > 2	**M (Medium)**		
2 > CHF	**L (Low)**		
CONTAMINANT HAZARD FACTOR	**DIRECTIONS:** Record **the CHF Value** from above in the box to the right maximum value = H).		

Migratory Pathway Factor

DIRECTIONS: Circle the value that corresponds most closely to the sediment migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the sediment is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in sediment has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the sediment to a potential point of exposure (possibly due to the presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	

Receptor Factor

DIRECTIONS: Circle the value that corresponds most closely to the sediment receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to sediment to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to sediment to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to sediment to which contamination has moved or can move.	L
RECEPTOR FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	

No Known or Suspected Sediment (Human Endpoint) MC Hazard	X

Table 24

HHE Module: Surface Water – Ecological Endpoint Data Element Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's surface water and their **comparison values** (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the contaminant **ratios** together, including any additional surface water contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard with ecological endpoints present in the surface water, select the box at the bottom of the table.

Contaminant	Maximum Concentration (μg/L)	Comparison Value (μg/L)	Ratios
No surface water samples collected.			
CHF Scale	**CHF Value**	**Sum the Ratios**	
CHF > 100	**H (High)**	$CHF = \sum \frac{[\text{Maximum Concentration of Contaminant}]}{[\text{Comparison Value for Contaminant}]}$	
100 > CHF > 2	**M (Medium)**		
2 > CHF	**L (Low)**		
CONTAMINANT HAZARD FACTOR	**DIRECTIONS:** Record **the CHF Value** from above in the box to the right (maximum value = H).		

Migratory Pathway Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface water migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the surface water is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in surface water has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the surface water to a potential point of exposure (possibly due to the presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	

Receptor Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface water receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to surface water to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to surface water to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to surface water to which contamination has moved or can move.	L
RECEPTOR FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	

No Known or Suspected Surface Water (Ecological Endpoint) MC Hazard	X

Table 25

HHE Module: Sediment – Ecological Endpoint Data Element Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's sediment and their **comparison values** (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the contaminant **ratios** together, including any additional sediment contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard with ecological endpoints present in the sediment, select the box at the bottom of the table.

.

Contaminant	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratios
No sediment samples collected.			
CHF Scale	**CHF Value**	**Sum the Ratios**	
CHF > 100	**H (High)**	$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
100 > CHF > 2	**M (Medium)**		
2 > CHF	**L (Low)**		
CONTAMINANT HAZARD FACTOR	**DIRECTIONS:** Record **the CHF Value** from above in the box to the right (maximum value = H).		

Migratory Pathway Factor

DIRECTIONS: Circle the value that corresponds most closely to the sediment migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the sediment is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in sediment has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the sediment to a potential point of exposure (possibly due to the presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	

Receptor Factor

DIRECTIONS: Circle the value that corresponds most closely to the sediment receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to sediment to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to sediment to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to sediment to which contamination has moved or can move.	L
RECEPTOR FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	

No Known or Suspected Sediment (Ecological Endpoint) MC Hazard	X

Table 26

HHE Module: Surface Soil Data Element Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's surface soil and their **comparison values** (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the contaminant **ratios** together, including any additional surface soil contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard present in the surface soil, select the box at the bottom of the table.

.

Contaminant	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratio
Samples collected, no contaminants found.			
CHF Scale	**CHF Value**	**Sum the Ratios**	
CHF > 100	**H (High)**		
100 > CHF > 2	**M (Medium)**	$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
2 > CHF	**L (Low)**		
CONTAMINANT HAZARD FACTOR	**DIRECTIONS:** Record **the CHF Value** from above in the box to the right (maximum value = H).		

Migratory Pathway Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface soil migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the surface soil is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in surface soil has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the surface soil to a potential point of exposure (possibly due to the presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	

Receptor Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface soil receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to surface soil to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to surface soil to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to surface soil to which contamination has moved or can move.	L
RECEPTOR FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	

No Known or Suspected Surface Soil MC Hazard	x

Table 27

HHE Module: Supplemental Contaminant Hazard Factor Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Only use this table if there are more than five contaminants in any given medium present at the MRS. This is a supplemental table designed to hold information about contaminants that do not fit in the previous tables. Indicate the **media** in which these contaminants are present. Then record all **contaminants**, their **maximum concentrations** and their **comparison values** (from Appendix B of the Primer) in the table below. Calculate and record the **ratio** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** for each medium on the appropriate media-specific tables.

Note: Do not add ratios from different media.

Media	Contaminant	Maximum Concentration	Comparison Value	Ratio

Table 28

Determining the HHE Module Rating

DIRECTIONS:

1. Record the letter values (H, M, L) for the **Contaminant Hazard**, **Migration Pathway**, and **Receptor Factors** for the media (from Tables 21–26) in the corresponding boxes below.
2. Record the media's three-letter combinations in the **Three-Letter Combination** boxes below (three-letter combinations are arranged from Hs to Ms to Ls).
3. Using the **HHE Ratings** provided below, determine each media's rating (A–G) and record the letter in the corresponding **Media Rating** box below.

Media (Source)	Contaminant Hazard Factor Value	Migratory Pathway Factor Value	Receptor Factor Value	Three-Letter Combination (Hs-Ms-Ls)	Media Rating (A-G)
Groundwater (Table 21)					
Surface Water/Human Endpoint (Table 22)					
Sediment/Human Endpoint (Table 23)					
Surface Water/Ecological Endpoint (Table 24)					
Sediment/Ecological Endpoint (Table 25)					
Surface Soil (Table 26)					

DIRECTIONS (cont.):

4. Select the single highest Media Rating (A is highest; G is lowest) and enter the letter in the **HHE Module Rating** box.

Note:
An alternative module rating may be assigned when a module letter rating is inappropriate. An alternative module rating is used when more information is needed to score one or more media, contamination at an MRS was previously addressed, or there is no reason to suspect contamination was ever present at an MRS.

HHE MODULE RATING	**No Known or Suspected MC Hazard**

HHE Ratings (for reference only)

Combination	Rating
HHH	A
HHM	B
HHL	C
HMM	C
HML	D
MMM	D
HLL	E
MML	E
MLL	F
LLL	G
Alternative Module Ratings	Evaluation Pending
	No Longer Required
	No Known or Suspected MC Hazard

Table 29

MRS Priority

DIRECTIONS: In the chart below, circle the letter **rating** for each module recorded in Table 10 (EHE), Table 20 (CHE), and Table 28 (HHE). Circle the corresponding numerical **priority** for each module. If information to determine the module rating is not available, choose the appropriate alternative module rating. The MRS Priority is the single highest priority; record this relative priority in the **MRS Priority or Alternative MRS Rating** at the bottom of the table.

Note: An MRS assigned Priority 1 has the highest relative priority; an MRS assigned Priority 8 has the lowest relative priority. Only an MRS with CWM known or suspected to be present can be assigned Priority 1; an MRS that has CWM known or suspected to be present cannot be assigned Priority 8.

EHE Rating	Priority	CHE Rating	Priority	HHE Rating	Priority
		A	**1**		
A	**2**	**B**	**2**	**A**	**2**
B	**3**	**C**	**3**	**B**	**3**
C	**4**	**D**	**4**	**C**	**4**
D	**5**	**E**	**5**	**D**	**5**
E	**6**	**F**	**6**	E	6
F	**7**	**G**	**7**	**F**	**7**
G	8			**G**	**8**
Evaluation Pending		Evaluation Pending		Evaluation Pending	
No Longer Required		No Longer Required		No Longer Required	
No Known or Suspected Explosive Hazard		**No Known or Suspected CWM Hazard**		**No Known or Suspected MC Hazard**	
MRS PRIORITY or ALTERNATIVE MRS RATING				No Known or Suspected Hazard	

Table A

MRS Background Information

DIRECTIONS: Record the background information below for the MRS to be evaluated. Much of this information is available from Service and DoD databases. If the MRS is located on a FUDS property, the suitable FUDS property information should be substituted. In the **MRS Summary**, briefly describe the UXO, DMM, or MC that are known or suspected to be present, the exposure setting (the MRS's physical environment), any other incidental nonmunitions-related contaminants (e.g., benzene, trichloroethylene) found at the MRS, and any potentially exposed human and ecological receptors. If possible, include a map of the MRS.

Munitions Response Site Name: **Small Arms Range 3 (FTSW-007-R-01)**

Component: **US Army**

Installation/Property Name: **Ft. Stewart**

Location (City, County, State): **Ft. Stewart, Liberty County, GA**

Site Name/Project Name (Project No.): **Ft. Stewart MRSPP SI (2118093)**

Date Information Entered/Updated: **July 24, 2007**

Point of Contact (Name/Phone): **Shelly Kolb, Malcolm Pirnie, Inc. / (410) 230-9958**

Project Phase (check only one):

❑ PA	✠ SI	❑ RI	❑ FS	❑ RD
❑ RA-C	❑ RIP	❑ RA-O	❑ RC	❑ LTM

Media Evaluated (check all that apply):

❑ Groundwater	❑ Sediment (human receptor)
✠ Surface soil	❑ Surface Water (ecological receptor)
❑ Sediment (ecological receptor)	❑ Surface Water (human receptor)

MRS Summary:

MRS Description: Describe the munitions-related activities that occurred at the installation, the dates of operation, and the UXO, DMM, or MC known or suspected to be present. When possible, identify munitions, CWM, and MC by type: The overlapping historical munitions use is a small arms range used in 1964. According to documents reviewed for the HRR, munitions used on the small arms range are believed to have been .50-cal or less; however, the exact caliber is unknown. No MEC or munitions debris was found.

Description of Pathways for Human and Ecological Receptors: Potentially complete pathways exist for authorized installation personnel, authorized contractors, and biota for MEC in the subsurface as these receptors have the potential to conduct intrusive activities. Potentially complete MC pathways for biota include game/fish/prey, surface soil, subsurface soil, and shallow groundwater.

Description of Receptors (Human and Ecological): The current human receptors of the Small Arms Range 3 are authorized installation personnel, contractors, and trespassers. There are a variety of species at this site.

Table 1

EHE Module: Munitions Type Data Element Table

DIRECTIONS: Below are 11 classifications of munitions and their descriptions. Circle the scores that correspond with **<u>all</u>** the munitions types known or suspected to be present at the MRS.

Note: The terms *practice munitions, small arms ammunition, physical evidence,* and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Score
Sensitive	◆ UXO that are considered most likely to function upon any interaction with exposed persons (e.g., submunitions, 40mm high-explosive [HE] grenades, white phosphorus [WP] munitions, high-explosive antitank [HEAT] munitions, and practice munitions with sensitive fuzes, but excluding all other practice munitions). ◆ Hand grenades containing energetic filler. ◆ Bulk primary explosives, or mixtures of these with environmental media, such that the mixture poses an explosive hazard.	30
High explosive (used or damaged)	◆ UXO containing a high-explosive filler (e.g., RDX, Composition B), that are not considered "sensitive." ◆ DMM containing a high-explosive filler that have: ▪ Been damaged by burning or detonation ▪ Deteriorated to the point of instability.	25
Pyrotechnic (used or damaged)	◆ UXO containing a pyrotechnic filler other than white phosphorus (e.g., flares, signals, simulators, smoke grenades). ◆ DMM containing a pyrotechnic filler other than white phosphorus (e.g., flares, signals, simulators, smoke grenades) that have: ▪ Been damaged by burning or detonation ▪ Deteriorated to the point of instability.	20
High explosive (unused)	◆ DMM containing a high-explosive filler that: ▪ Have not been damaged by burning or detonation ▪ Are not deteriorated to the point of instability.	15
Propellant	◆ UXO containing mostly single-, double-, or triple-based propellant, or composite propellants (e.g., a rocket motor). ◆ DMM containing mostly single-, double-, or triple-based propellant, or composite propellants (e.g., a rocket motor) that are: ▪ Damaged by burning or detonation ▪ Deteriorated to the point of instability.	15
Bulk secondary high explosives, pyrotechnics, or propellant	◆ DMM containing mostly single-, double-, or triple-based propellant, or composite propellants (e.g., a rocket motor). ◆ DMM that are bulk secondary high explosives, pyrotechnic compositions, or propellant (not contained in a munition), or mixtures of these with environmental media such that the mixture poses an explosive hazard.	10
Pyrotechnic (not used or damaged)	◆ DMM containing a pyrotechnic filler (i.e., red phosphorus), other than white phosphorus filler, that: ▪ Have not been damaged by burning or detonation ▪ Are not deteriorated to the point of instability.	10
Practice	◆ UXO that are practice munitions that are not associated with a sensitive fuze. ◆ DMM that are practice munitions that are not associated with a sensitive fuze and that have not: ▪ Been damaged by burning or detonation ▪ Deteriorated to the point of instability.	5
Riot control	◆ UXO or DMM containing a riot control agent filler (e.g., tear gas).	3
Small arms	◆ Used munitions or DMM that are categorized as small arms ammunition. (Physical evidence or historical evidence that no other types of munitions [e.g., grenades, subcaliber training rockets, demolition charges] were used or are present on the MRS is required for selection of this category.)	2
Evidence of no munitions	◆ Following investigation of the MRS, there is physical evidence that there are no UXO or DMM present, or there is historical evidence indicating that no UXO or DMM are present.	**<u>0</u>**
MUNITIONS TYPE	**DIRECTIONS:** Record **<u>the single highest score</u>** from above in the box to the right (maximum score = 30).	**<u>0</u>**

Table 1

EHE Module: Munitions Type Data Element Table

DIRECTIONS: Below are 11 classifications of munitions and their descriptions. Circle the scores that correspond with **all** the munitions types known or suspected to be present at the MRS.

Note: The terms *practice munitions, small arms ammunition, physical evidence,* and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Score

DIRECTIONS: Document any MRS-specific data used in selecting the ***Munitions Type*** classifications in the space provided.

According to information from the Phase 3 range inventory, only small arms were used at this MRS. According to documents reviewed for the HRR, munitions used on the small arms range were .50-cal or less; however, the exact caliber is unknown. (CS Report, Section 4.7.1)

Table 2

EHE Module: Source of Hazard Data Element Table

DIRECTIONS: Below are 11 classifications describing sources of explosive hazards. Circle the scores that correspond with **all** the sources of explosive hazards known or suspected to be present at the MRS.

Note: The terms *former range, practice munitions, small arms range, physical evidence,* and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Score
Former range	◆ The MRS is a former military range where munitions (including practice munitions with sensitive fuzes) have been used. Such areas include impact or target areas and associated buffer and safety zones.	10
Former munitions treatment (i.e., OB/OD) unit	◆ The MRS is a location where UXO or DMM (e.g., munitions, bulk explosives, bulk pyrotechnic, or bulk propellants) were burned or detonated for the purpose of treatment prior to disposal.	8
Former practice munitions range	◆ The MRS is a former military range on which only practice munitions without sensitive fuzes were used.	6
Former maneuver area	◆ The MRS is a former maneuver area where no munitions other than flares, simulators, smokes, and blanks were used. There must be evidence that no other munitions were used at the location to place an MRS into this category.	5
Former burial pit or other disposal area	◆ The MRS is a location where DMM were buried or disposed of (e.g., disposed of into a water body) without prior thermal treatment.	5
Former industrial operating facilities	◆ The MRS is a location that is a former munitions maintenance, manufacturing, or demilitarization facility.	4
Former firing points	◆ The MRS is a firing point, where the firing point is delineated as an MRS separate from the rest of a former military range.	4
Former missile or air defense artillery emplacements	◆ The MRS is a former missile defense or air defense artillery (ADA) emplacement not associated with a military range.	2
Former storage or transfer points	◆ The MRS is a location where munitions were stored or handled for transfer between different modes of transportation (e.g., rail to truck, truck to weapon system).	2
Former small arms range	◆ The MRS is a former military range where only small arms ammunition was used. (There must be evidence that no other types of munitions [e.g., grenades] were used or are present to place an MRS into this category.)	1
Evidence of no munitions	◆ Following investigation of the MRS, there is physical evidence that no UXO or DMM are present, or there is historical evidence indicating that no UXO or DMM are present.	**<u>0</u>**
SOURCE OF HAZARD	**DIRECTIONS:** Record **<u>the single highest score</u>** from above in the box to the right (maximum score = 10).	**<u>0</u>**

DIRECTIONS: Document any MRS-specific data used in selecting the ***Source of Hazard*** classifications in the space provided.

No explosive hazard is expected at this site.

Table 3

EHE Module: Location of Munitions Data Element Table

DIRECTIONS: Below are eight classifications of munitions locations and their descriptions. Circle the scores that correspond with **all** the locations where munitions are known or suspected to be present at the MRS.

Note: The terms *confirmed, surface, subsurface, small arms ammunition, physical evidence,* and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Score
Confirmed surface	◆ Physical evidence indicates that there are UXO or DMM on the surface of the MRS. ◆ Historical evidence (i.e., a confirmed report such as an explosive ordnance disposal [EOD], police, or fire department report that an incident or accident that involved UXO or DMM occurred) indicates there are UXO or DMM on the surface of the MRS.	25
Confirmed subsurface, active	◆ Physical evidence indicates the presence of UXO or DMM in the subsurface of the MRS, and the geological conditions at the MRS are likely to cause UXO or DMM to be exposed, in the future, by naturally occurring phenomena (e.g., drought, flooding, erosion, frost heave, tidal action), or intrusive activities (e.g., plowing, construction, dredging) at the MRS are likely to expose UXO or DMM. ◆ Historical evidence indicates that UXO or DMM are located in the subsurface of the MRS and the geological conditions at the MRS are likely to cause UXO or DMM to be exposed, in the future, by naturally occurring phenomena (e.g., drought, flooding, erosion, frost heave, tidal action), or intrusive activities (e.g., plowing, construction, dredging) at the MRS are likely to expose UXO or DMM.	20
Confirmed subsurface, stable	◆ Physical evidence indicates the presence of UXO or DMM in the subsurface of the MRS and the geological conditions at the MRS are not likely to cause UXO or DMM to be exposed, in the future, by naturally occurring phenomena, or intrusive activities at the MRS are not likely to cause UXO or DMM to be exposed. ◆ Historical evidence indicates that UXO or DMM are located in the subsurface of the MRS and the geological conditions at the MRS are not likely to cause UXO or DMM to be exposed, in the future, by naturally occurring phenomena, or intrusive activities at the MRS are not likely to cause UXO or DMM to be exposed.	15
Suspected (physical evidence)	◆ There is physical evidence (e.g., munitions debris such as fragments, penetrators, projectiles, shell casings, links, fins), other than the documented presence of UXO or DMM, indicating that UXO or DMM may be present at the MRS.	10
Suspected (historical evidence)	◆ There is historical evidence indicating that UXO or DMM may be present at the MRS.	5
Subsurface, physical constraint	◆ There is physical or historical evidence indicating that UXO or DMM may be present in the subsurface, but there is a physical constraint (e.g., pavement, water depth over 120 feet) preventing direct access to the UXO or DMM.	2
Small arms (regardless of location)	◆ The presence of small arms ammunition is confirmed or suspected, regardless of other factors such as geological stability. (There must be evidence that no other types of munitions [e.g., grenades] were used or are present at the MRS to place an MRS into this category.)	1
Evidence of no munitions	◆ Following investigation of the MRS, there is physical evidence that there are no UXO or DMM present, or there is historical evidence indicating that no UXO or DMM are present.	**0**
LOCATION OF MUNITIONS	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 25).	**0**

DIRECTIONS: Document any MRS-specific data used in selecting the ***Location of Munitions*** classifications in the space provided.

No explosive hazard is expected at this site.

Table 4-9
EHE Module

Because only small arms were used at this site and no explosive hazard is expected, Tables 4-9 have been omitted according to Active-Army Guidance. (CS Report, Section 4.7.1)

Table 10

Determining the EHE Module Rating

DIRECTIONS:

1. From Tables 1–9, record the data element scores in the **Score** boxes to the right.
2. Add the **Score** boxes for each of the three factors and record this number in the **Value** boxes to the right.
3. Add the three **Value** boxes and record this number in the **EHE Module Total** box below.
4. Circle the appropriate range for the **EHE Module Total** below.
5. Circle the **EHE Module Rating** that corresponds to the range selected and record this value in the **EHE Module Rating** box found at the bottom of the table.

Note:
An alternative module rating may be assigned when a module letter rating is inappropriate. An alternative module rating is used when more information is needed to score one or more data elements, contamination at an MRS was previously addressed, or there is no reason to suspect contamination was ever present at an MRS.

	Source	Score	Value
Explosive Hazard Factor Data Elements			
Munitions Type	Table 1	0	0
Source of Hazard	Table 2	0	
Accessibility Factor Data Elements			
Location of Munitions	Table 3	0	-
Ease of Access	Table 4	-	
Status of Property	Table 5	-	
Receptor Factor Data Elements			
Population Density	Table 6	-	-
Population Near Hazard	Table 7	-	
Types of Activities/Structures	Table 8	-	
Ecological and/or Cultural Resources	Table 9	-	
EHE MODULE TOTAL			-

EHE Module Total	EHE Module Rating
92 to 100	A
82 to 91	B
71 to 81	C
60 to 70	D
48 to 59	E
38 to 47	F
less than 38	G
Alternative Module Ratings	Evaluation Pending
	No Longer Required
	No Known or Suspected Explosive Hazard
EHE MODULE RATING	**No Known or Suspected Explosive Hazard**

Table 11

CHE Module: CWM Configuration Data Element Table

DIRECTIONS: Below are seven classifications of CWM configuration and their descriptions. Circle the scores that correspond with **all** the CWM configurations known or suspected to be present at the MRS.

Note: The terms *CWM/UXO, CWM/DMM, physical evidence,* and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Score
CWM, that are either UXO, or explosively configured damaged DMM	The CWM known or suspected of being present at the MRS are: ◆ CWM that are UXO (i.e., CWM/UXO) ◆ Explosively configured CWM that are DMM (i.e., CWM/DMM) that have been damaged.	30
CWM mixed with UXO	◆ The CWM known or suspected of being present at the MRS are undamaged CWM/DMM or CWM not configured as a munition that are commingled with conventional munitions that are UXO.	25
CWM, explosive configuration that are undamaged DMM	◆ The CWM known or suspected of being present at the MRS are explosively configured CWM/DMM that have not been damaged.	20
CWM/DMM, not explosively configured or CWM, bulk container	The CWM known or suspected of being present at the MRS are: ◆ Nonexplosively configured CWM/DMM either damaged or undamaged ◆ Bulk CWM (e.g., ton container).	15
CAIS K941 and CAIS K942	◆ The CWM/DMM known or suspected of being present at the MRS are CAIS K941-toxic gas set M-1 or CAIS K942-toxic gas set M-2/E11.	12
CAIS (chemical agent identification sets)	◆ CAIS, other than CAIS K941 and K942, are known or suspected of being present at the MRS.	10
Evidence of no CWM	◆ Following investigation, the physical evidence indicates that CWM are not present at the MRS, or the historical evidence indicates that CWM are not present at the MRS.	**0**
CWM CONFIGURATION	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 30).	**0**

DIRECTIONS: Document any MRS-specific data used in selecting the ***CWM Configuration*** classifications in the space provided.

Small arms are the only types of munitions used on this MRS. (CS Report , Section 4.7.1)

Table 12

CHE Module: Sources of CWM Data Element Table

DIRECTIONS: Below are 11 sources of CWM hazards and their descriptions. Review these classifications and circle the scores that correspond with **all** the sources of CWM hazards known or suspected to be present at the MRS.

Note: The terms *CWM/UXO, CWM/DMM, CAIS/DMM, surface, subsurface, physical evidence,* and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Score
Live-fire involving CWM	◆ The MRS is a former military range that supported live-fire of explosively configured CWM and the CWM/UXO are known or suspected of being present on the surface or in the subsurface. ◆ The MRS is a former military range that supported live-fire with conventional munitions, and CWM/DMM are on the surface or in the subsurface commingled with conventional munitions that are UXO.	10
Damaged CWM/DMM surface or subsurface	◆ There are damaged CWM/DMM on the surface or in the subsurface at the MRS.	10
Undamaged CWM/DMM surface	◆ There are undamaged CWM/DMM on the surface at the MRS.	10
CAIS/DMM surface	◆ There are CAIS/DMM on the surface.	10
Undamaged CWM/DMM, subsurface	◆ There are undamaged CWM/DMM in the subsurface at the MRS.	5
CAIS/DMM subsurface	◆ There are CAIS/DMM in the subsurface at the MRS.	5
Former CA or CWM Production Facilities	◆ The MRS is a facility that formerly engaged in production of CA or CWM, and CWM/DMM is suspected of being present on the surface or in the subsurface.	3
Former Research, Development, Testing, and Evaluation (RDT&E) facility using CWM	◆ The MRS is at a facility that formerly was involved in non-live-fire RDT&E activities (including static testing) involving CWM, and there are CWM/DMM suspected of being present on the surface or in the subsurface.	3
Former Training Facility using CWM or CAIS	◆ The MRS is a location that formerly was involved in training activities involving CWM and/or CAIS (e.g., training in recognition of CWM, decontamination training) and CWM/DMM or CAIS/DMM are suspected of being present on the surface or in the subsurface.	2
Former Storage or Transfer points of CWM	◆ The MRS is a former storage facility or transfer point (e.g., intermodal transfer) for CWM.	1
Evidence of no CWM	◆ Following investigation, the physical evidence indicates that CWM are not present at the MRS, or the historical evidence indicates that CWM are not present at the MRS.	**0**
SOURCES OF CWM	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 10).	**0**

DIRECTIONS: Document any MRS-specific data used in selecting the ***Sources of CWM*** classifications in the space provided.

There is no historical or current evidence of CWM existing on this MRS.

Table 13

CHE Module: Location of CWM Data Element Table

DIRECTIONS: Below are seven classifications of CWM locations and their descriptions. Review these locations and circle the scores that correspond with **all** the locations where CWM are known or suspected of being found at the MRS.

Note: The terms *confirmed, surface, subsurface, physical evidence,* and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Score
Confirmed surface	◆ Physical evidence indicates that there are CWM on the surface of the MRS. ◆ Historical evidence (i.e., a confirmed report such as an explosive ordnance disposal [EOD], police, or fire department report, that an incident or accident that involved CWM, regardless of configuration, occurred) indicates there are CWM on the surface of the MRS.	25
Confirmed subsurface, active	◆ Physical evidence indicates the presence of CWM in the subsurface of the MRS and the geological conditions at the MRS are likely to cause CWM to be exposed, in the future, by naturally occurring phenomena (e.g., drought, flooding, erosion, frost heave, tidal action), or intrusive activities (e.g., plowing, construction, dredging) at the MRS are likely to expose CWM. ◆ Historical evidence indicates that CWM are located in the subsurface of the MRS and the geological conditions at the MRS are likely to cause CWM to be exposed, in the future, by naturally occurring phenomena (e.g., drought, flooding, erosion, frost heave, tidal action), or intrusive activities (e.g., plowing, construction, dredging) at the MRS are likely to expose CWM.	20
Confirmed subsurface, stable	◆ Physical evidence indicates the presence of CWM in the subsurface of the MRS and the geological conditions at the MRS are not likely to cause CWM to be exposed, in the future, by naturally occurring phenomena, or intrusive activities at the MRS are not likely to cause CWM to be exposed. ◆ Historical evidence indicates that CWM are located in the subsurface of the MRS and the geological conditions at the MRS are not likely to cause CWM to be exposed, in the future, by naturally occurring phenomena, or intrusive activities at the MRS are not likely to cause CWM to be exposed.	15
Suspected (physical evidence)	◆ There is physical evidence, other than the documented presence of CWM, indicating that CWM may be present at the MRS.	10
Suspected (historical evidence)	◆ There is historical evidence indicating that CWM may be present at the MRS.	5
Subsurface, physical constraint	◆ There is physical or historical evidence indicating that CWM may be present in the subsurface, but there is a physical constraint (e.g., pavement, water depth over 120 feet) preventing direct access to the CWM.	2
Evidence of no CWM	◆ Following investigation of the MRS, there is physical evidence that there is no CWM present or there is historical evidence indicating that no CWM are present.	**0**
LOCATION OF CWM	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 25).	**0**

DIRECTIONS: Document any MRS-specific data used in selecting the ***Location of CWM*** classifications in the space provided.

There is no historical or current evidence of CWM existing on this MRS.

Tables 14-19

CHE Module: Sources of CWM Data Element Table

Because there is no historical or current evidence of CWM existing on this MRS, Tables 14-19 have been omitted according to Active-Army Guidance.

Table 20
Determining the CHE Module Rating

DIRECTIONS:

1. From Tables 11–19, record the data element scores in the **Score** boxes to the right.
2. Add the **Score** boxes for each of the three factors and record this number in the **Value** boxes to the right.
3. Add the three **Value** boxes and record this number in the **CHE Module Total** box below.
4. Circle the appropriate range for the **CHE Module Total** below.
5. Circle the **CHE Module Rating** that corresponds to the range selected and record this value in the **CHE Module Rating** box found at the bottom of the table.

Note:
An alternative module rating may be assigned when a module letter rating is inappropriate. An alternative module rating is used when more information is needed to score one or more data elements, contamination at an MRS was previously addressed, or there is no reason to suspect contamination was ever present at an MRS.

	Source	Score	Value
CWM Hazard Factor Data Elements			
CWM Configuration	Table 11	0	0
Sources of CWM	Table 12	0	
Accessibility Factor Data Elements			
Location of CWM	Table 13	0	-
Ease of Access	Table 14	-	
Status of Property	Table 15	-	
Receptor Factor Data Elements			
Population Density	Table 16	-	-
Population Near Hazard	Table 17	-	
Types of Activities/Structures	Table 18	-	
Ecological and/or Cultural Resources	Table 19	-	
CHE MODULE TOTAL			-

CHE Module Total	CHE Module Rating
92 to 100	A
82 to 91	B
71 to 81	C
60 to 70	D
48 to 59	E
38 to 47	F
less than 38	G
Alternative Module Ratings	Evaluation Pending
	No Longer Required
	No Known or Suspected CWM Hazard
CHE MODULE RATING	**No Known or Suspected CWM Hazard**

Table 21

HHE Module: Groundwater Data Element Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's groundwater and their **comparison values** (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the contaminant **ratios** together, including any additional groundwater contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard present in the groundwater, select the box at the bottom of the table.

Contaminant	Maximum Concentration (μg/L)	Comparison Value (μg/L)	Ratios
No groundwater samples collected.			
CHF Scale	**CHF Value**	**Sum The Ratios**	
CHF > 100	**H (High)**	$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
100 > CHF > 2	**M (Medium)**		
2 > CHF	**L (Low)**		
CONTAMINANT HAZARD FACTOR	**DIRECTIONS:** Record **the CHF Value** from above in the box to the right (maximum value = H).		

Migratory Pathway Factor

DIRECTIONS: Circle the value that corresponds most closely to the groundwater migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the groundwater is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in groundwater has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the groundwater to a potential point of exposure (possibly due to the presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	

Receptor Factor

DIRECTIONS: Circle the value that corresponds most closely to the groundwater receptors at the MRS.

Classification	Description	Value
Identified	There is a threatened water supply well downgradient of the source and the groundwater is a current source of drinking water or source of water for other beneficial uses such as irrigation/agriculture (equivalent to Class I or IIA aquifer).	H
Potential	There is no threatened water supply well downgradient of the source and the groundwater is currently or potentially usable for drinking water, irrigation, or agriculture (equivalent to Class I, IIA, or IIB aquifer).	M
Limited	There is no potentially threatened water supply well downgradient of the source and the groundwater is not considered a potential source of drinking water and is of limited beneficial use (equivalent to Class IIIA or IIIB aquifer, or where perched aquifer exists only).	L
RECEPTOR FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	

No Known or Suspected Groundwater MC Hazard	X

Table 22

HHE Module: Surface Water – Human Endpoint Data Element Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's surface water and their **comparison values** (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the contaminant **ratios** together, including any additional surface water contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard with human endpoints present in the surface water, select the box at the bottom of the table.

Contaminant	Maximum Concentration (μg/L)	Comparison Value (μg/L)	Ratios
No surface water samples collected.			
CHF Scale	**CHF Value**	**Sum The Ratios**	
CHF > 100	**H (High)**	$CHF = \sum \frac{[\text{Maximum Concentration of Contaminant}]}{[\text{Comparison Value for Contaminant}]}$	
100 > CHF > 2	**M (Medium)**		
2 > CHF	**L (Low)**		
CONTAMINANT HAZARD FACTOR	**DIRECTIONS:** Record **the CHF Value** from above in the box to the right (maximum value = H).		

Migratory Pathway Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface water migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the surface water is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in surface water has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the surface water to a potential point of exposure (possibly due to the presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	

Receptor Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface water receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to surface water to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to surface water to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to surface water to which contamination has moved or can move.	L
RECEPTOR FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	

No Known or Suspected Surface Water (Human Endpoint) MC Hazard	X

Table 23

HHE Module: Sediment – Human Endpoint Data Element Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's sediment and their **comparison values** (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the contaminant **ratios** together, including any additional sediment contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard with human endpoints present in the sediment, select the box at the bottom of the table.

Contaminant	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratios
No sediment samples collected.			
CHF Scale	**CHF Value**	**Sum The Ratios**	
CHF > 100	**H (High)**	$CHF = \sum \frac{[\text{Maximum Concentration of Contaminant}]}{[\text{Comparison Value for Contaminant}]}$	
100 > CHF > 2	**M (Medium)**		
2 > CHF	**L (Low)**		
CONTAMINANT HAZARD FACTOR	**DIRECTIONS:** Record **the CHF Value** from above in the box to the right maximum value = H).		

Migratory Pathway Factor

DIRECTIONS: Circle the value that corresponds most closely to the sediment migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the sediment is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in sediment has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the sediment to a potential point of exposure (possibly due to the presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	

Receptor Factor

DIRECTIONS: Circle the value that corresponds most closely to the sediment receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to sediment to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to sediment to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to sediment to which contamination has moved or can move.	L
RECEPTOR FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	

No Known or Suspected Sediment (Human Endpoint) MC Hazard	X

Table 24

HHE Module: Surface Water – Ecological Endpoint Data Element Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's surface water and their **comparison values** (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the contaminant **ratios** together, including any additional surface water contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard with ecological endpoints present in the surface water, select the box at the bottom of the table.

Contaminant	Maximum Concentration (μg/L)	Comparison Value (μg/L)	Ratios
No surface water samples collected.			
CHF Scale	**CHF Value**	**Sum the Ratios**	
CHF > 100	**H (High)**	$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
100 > CHF > 2	**M (Medium)**		
2 > CHF	**L (Low)**		
CONTAMINANT HAZARD FACTOR	**DIRECTIONS:** Record **the CHF Value** from above in the box to the right (maximum value = H).		

Migratory Pathway Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface water migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the surface water is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in surface water has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the surface water to a potential point of exposure (possibly due to the presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	

Receptor Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface water receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to surface water to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to surface water to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to surface water to which contamination has moved or can move.	L
RECEPTOR FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	

No Known or Suspected Surface Water (Ecological Endpoint) MC Hazard	X

Table 25

HHE Module: Sediment – Ecological Endpoint Data Element Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's sediment and their **comparison values** (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the contaminant **ratios** together, including any additional sediment contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard with ecological endpoints present in the sediment, select the box at the bottom of the table.

.

Contaminant	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratios
No sediment samples collected.			
CHF Scale	**CHF Value**	**Sum the Ratios**	
CHF > 100	**H (High)**	$$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$$	
100 > CHF > 2	**M (Medium)**		
2 > CHF	**L (Low)**		
CONTAMINANT HAZARD FACTOR	**DIRECTIONS:** Record **the CHF Value** from above in the box to the right (maximum value = H).		

Migratory Pathway Factor

DIRECTIONS: Circle the value that corresponds most closely to the sediment migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the sediment is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in sediment has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the sediment to a potential point of exposure (possibly due to the presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	

Receptor Factor

DIRECTIONS: Circle the value that corresponds most closely to the sediment receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to sediment to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to sediment to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to sediment to which contamination has moved or can move.	L
RECEPTOR FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	

No Known or Suspected Sediment (Ecological Endpoint) MC Hazard	X

Table 26

HHE Module: Surface Soil Data Element Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's surface soil and their **comparison values** (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the contaminant **ratios** together, including any additional surface soil contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard present in the surface soil, select the box at the bottom of the table.

.

Contaminant	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratio
Samples collected, no contaminants found.			
CHF Scale	**CHF Value**	**Sum the Ratios**	
CHF > 100	**H (High)**		
100 > CHF > 2	**M (Medium)**		
2 > CHF	**L (Low)**		

$$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$$

CONTAMINANT HAZARD FACTOR	**DIRECTIONS:** Record **the CHF Value** from above in the box to the right (maximum value = H).	

Migratory Pathway Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface soil migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the surface soil is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in surface soil has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the surface soil to a potential point of exposure (possibly due to the presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	

Receptor Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface soil receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to surface soil to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to surface soil to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to surface soil to which contamination has moved or can move.	L
RECEPTOR FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	

No Known or Suspected Surface Soil MC Hazard x

Table 27

HHE Module: Supplemental Contaminant Hazard Factor Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Only use this table if there are more than five contaminants in any given medium present at the MRS. This is a supplemental table designed to hold information about contaminants that do not fit in the previous tables. Indicate the **media** in which these contaminants are present. Then record all **contaminants**, their **maximum concentrations** and their **comparison values** (from Appendix B of the Primer) in the table below. Calculate and record the **ratio** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** for each medium on the appropriate media-specific tables.

Note: Do not add ratios from different media.

Media	Contaminant	Maximum Concentration	Comparison Value	Ratio

Table 28
Determining the HHE Module Rating

DIRECTIONS:

1. Record the letter values (H, M, L) for the **Contaminant Hazard**, **Migration Pathway**, and **Receptor Factors** for the media (from Tables 21–26) in the corresponding boxes below.
2. Record the media's three-letter combinations in the **Three-Letter Combination** boxes below (three-letter combinations are arranged from Hs to Ms to Ls).
3. Using the **HHE Ratings** provided below, determine each media's rating (A–G) and record the letter in the corresponding **Media Rating** box below.

Media (Source)	Contaminant Hazard Factor Value	Migratory Pathway Factor Value	Receptor Factor Value	Three-Letter Combination (Hs-Ms-Ls)	Media Rating (A-G)
Groundwater (Table 21)					
Surface Water/Human Endpoint (Table 22)					
Sediment/Human Endpoint (Table 23)					
Surface Water/Ecological Endpoint (Table 24)					
Sediment/Ecological Endpoint (Table 25)					
Surface Soil (Table 26)					

DIRECTIONS (cont.):

4. Select the single highest Media Rating (A is highest; G is lowest) and enter the letter in the **HHE Module Rating** box.

Note:
An alternative module rating may be assigned when a module letter rating is inappropriate. An alternative module rating is used when more information is needed to score one or more media, contamination at an MRS was previously addressed, or there is no reason to suspect contamination was ever present at an MRS.

HHE MODULE RATING	**No Known or Suspected MC Hazard**

HHE Ratings (for reference only)

Combination	Rating
HHH	A
HHM	B
HHL	C
HMM	C
HML	D
MMM	D
HLL	E
MML	E
MLL	F
LLL	G
Alternative Module Ratings	Evaluation Pending
	No Longer Required
	No Known or Suspected MC Hazard

Table 29
MRS Priority

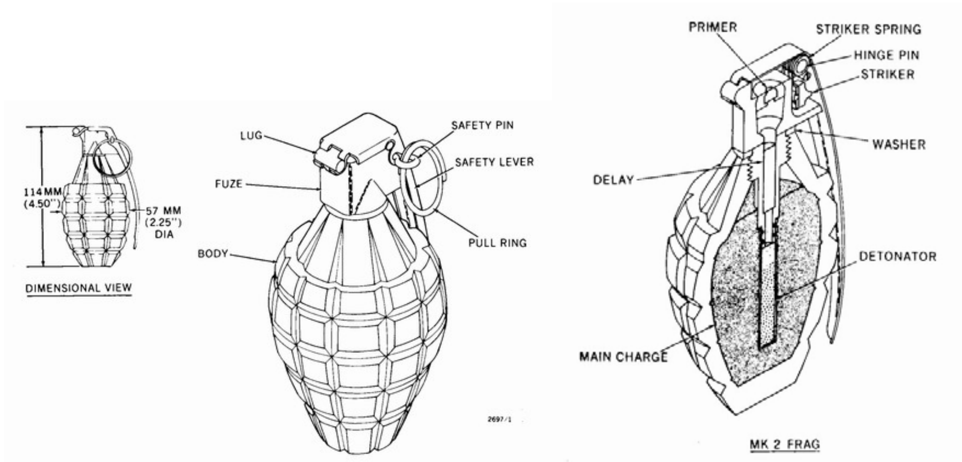
DIRECTIONS: In the chart below, circle the letter **rating** for each module recorded in Table 10 (EHE), Table 20 (CHE), and Table 28 (HHE). Circle the corresponding numerical **priority** for each module. If information to determine the module rating is not available, choose the appropriate alternative module rating. The MRS Priority is the single highest priority; record this relative priority in the **MRS Priority or Alternative MRS Rating** at the bottom of the table.

Note: An MRS assigned Priority 1 has the highest relative priority; an MRS assigned Priority 8 has the lowest relative priority. Only an MRS with CWM known or suspected to be present can be assigned Priority 1; an MRS that has CWM known or suspected to be present cannot be assigned Priority 8.

EHE Rating	Priority	CHE Rating	Priority	HHE Rating	Priority
		A	1		
A	2	B	2	A	2
B	3	C	3	B	3
C	4	D	4	C	4
D	5	E	5	D	5
E	6	F	6	E	6
F	7	G	7	F	7
G	8			G	8
Evaluation Pending		Evaluation Pending		Evaluation Pending	
No Longer Required		No Longer Required		No Longer Required	
No Known or Suspected Explosive Hazard		**No Known or Suspected CWM Hazard**		**No Known or Suspected MC Hazard**	
MRS PRIORITY or ALTERNATIVE MRS RATING				No Known or Suspected Hazard	

Appendix G: Ordnance Technical Data Sheets

Ordnance Technical Data Sheet
MK II Hand Grenade



Nomenclature:	MK II Grenade, Hand Anti-personnel
Ordnance Family:	Grenade
DODIC:	N/A obsolete
Filler:	Flaked TNT*
Filler weight:	$\pm$ 56.70 g (2 oz)
Item weight:	589.68 g (1.3 lbs)
Diameter:	57.00 mm (2.244in)
Length:	114.00 mm (4.88in)
Maximum Range:	10.00 m (10.44 yds)
Fragmentation Distance:	152.20 m (500 feet)
Fuze:	M204 A2 or A2 Fuze

Usage: Fragmentation (frag), antipersonnel, delay-detonating hand grenade.

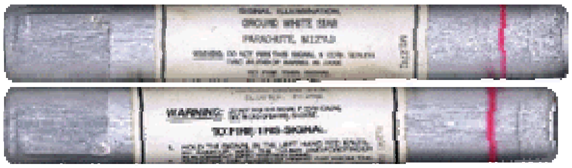
Description: The Mk II grenade is painted olive drab, with a yellow band around the top of the fuze well. Slang name is "Pineapple" because of its shape and external serrations.

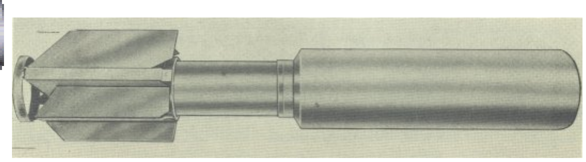
Reference: ORDATA Online, Army Field Manual FM 3-23.30

***TNT** also known as 2,4,6 Trinitrotoluene. It has a color of yellow to yellowish brown, depending on purity. A main-charge explosive used as a filler for high-explosive shells, bombs, depth charges, large coastal mines, rockets, and as a demolition charge. Employed as a booster in pressed granular form. When flaked, may be used in small-caliber shells and projectiles, and in fragmentation hand grenades.

Ordnance Technical Data Sheet

U.S. SIGNAL, ILLUM, GROUND, CLUSTERS, M125A1, M158, M159; PARACHUTES, M126A1, M127A1, M195 & M207





Nomenclature: Signal, Illum, Ground, Clusters, M125A1, M158, M159; Parachutes, M126A1, M127A1, M195 & M207
Ordnance Family: Pyrotechnics and Flares
DODIC: Not Provided
Filler: Black Powder
Filler weight: Not Provided
Item Weight: Not Available
Diameter: 42.00 mm (1.65 in)
Length: 258.00 mm (10.16 in)
Maximum Range: Not Provided
Fuze: Friction

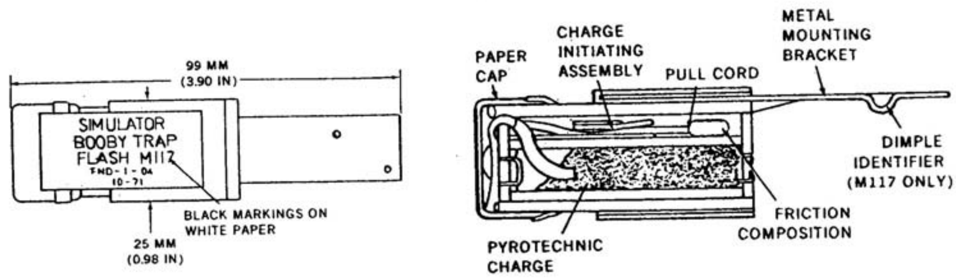
Usage: These hand held rocket propelled signal grenades eliminated the need for a rifle or grenade launcher for signaling purposes. These signals contained their own launching mechanism and were designed to reach a minimum height of 200 metres. This group of ground signals includes the single star parachute flares, five star clusters, smoke parachutes, colored smoke streamers and the white parachute flare.

Description: These signals were shipped in gray waterproof metal containers. They have black markings which identify their type and in addition they have letters embossed in the container ends to help identify at night. It measures about 27cm long and 4.5cm in diameter. The signal is composed of three parts: Rocket Barrel (Launcher Tube): The rocket barrel made of drawn aluminum contains the complete launching and signaling devices.

Reference: ORDATA Online.

Ordnance Technical Data Sheet

U.S. SIMULATOR, EXPLOSIVE BOOBYTRAP, FLASH, M117; ILLUM, M118; WHISTLING, M119



Nomenclature:	Simulator, Explosive Booby trap, Flash, M117; Illum, M118; Whistling, M119
Ordnance Family:	Miscellaneous Explosive Devices
DODIC:	Not Provided
Filler:	Pyrotechnic Composition*
Filler weight:	2.55 g (1.4 dr)
Item Weight:	63.50 g (2.24 oz)
Diameter:	25.00 mm (.98 in)
Length:	99.00 mm (3.9 in)
Maximum Range:	Not Provided
Fuze:	Friction

Usage: They simulate a booby trap. They will either illuminate, whistle or produce a flash.

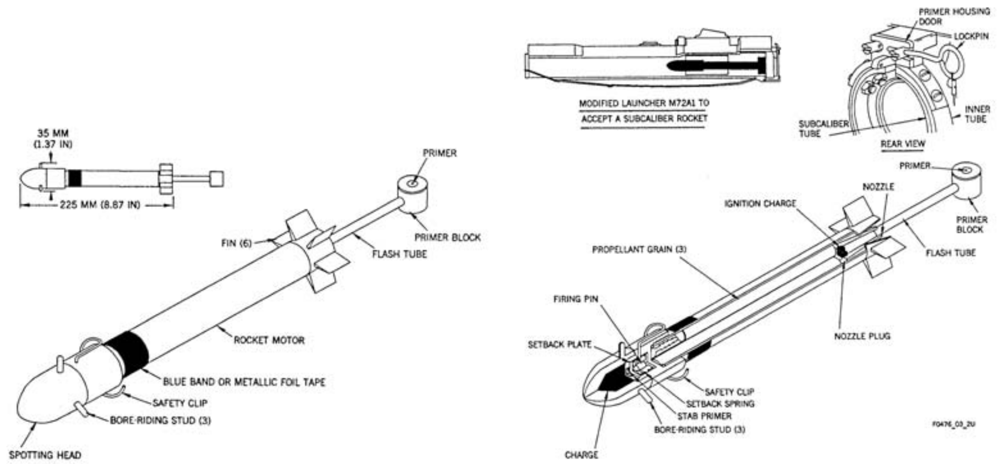
Description: It has a white paper body with black markings. Externally these simulators are identical.

Reference: ORDATA Online.

* SIMULATORS AND DECOYS. This class of pyrotechnics are intended to produce smoke, flame and sounds which approximate that produced by actual weapons used in military operations in a ground or surface environment. These items can simulate explosives, booby traps, artillery flash, artillery impact, hand grenades, artillery air burst and other similar events.

Ordnance Technical Data Sheet

U.S. ROCKET, 35-MM, SUBCALIBER, PRACTICE, M73



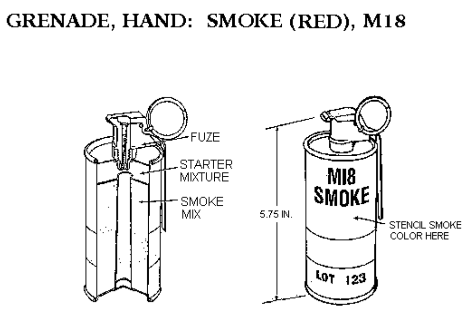
Nomenclature:	U.S. Rocket, 35-MM, Sub-caliber, Practice, M73
Ordnance Family:	Rocket
DODIC:	Not Provided
Filler:	Propellant, Rocket, Double-Base
Filler weight:	10.00 g (.3527 oz)
Item weight:	145.00 g (5.115 oz)
Diameter:	35.00 mm (1.3878 in)
Length:	225.00 mm (8.858 in)
Maximum Range:	220 m (240.6 yds)
Fuze:	Impact-inertia fuze

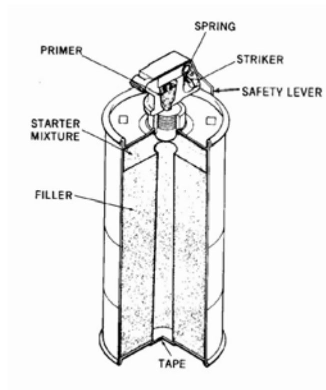
Usage: This is a sub-caliber practice rocket incorporating an integral, impact-inertia fuze. It is used for training and simulates the rocket for the light antitank weapon (LAW) system. The rocket is fired from a practice M190 launcher (a modified M72A1 LAW launcher). The figure shows the appearance and dimensions of the M73 practice rocket and M190 launcher.

Description: The spotting head and fins are painted black; the remainder of the rocket is olive drab. A blue band appears on the forward end of the rocket motor. On later production rockets, the spotting head is painted blue and the fins are painted brown. The rocket motor section is olive drab with white markings. A metallic foil covered tape is attached around the forward end of the rocket motor for weight adjustment.

Reference: ORDATA Online.

Ordnance Technical Data Sheet
Grenade, Hand Smoke M18





Nomenclature:	Grenade Hand Smoke M18
Ordnance Family:	Pyrotechnic
DODIC:	G945
Filler:	Smoke Mixture*
Filler weight:	± 326.03 g (11.5 oz)
Item weight:	536 g (19 oz)
Diameter:	64.00 mm (2.42 in)
Length:	146 mm (5.75in)
Maximum Range:	N/A
Fuze:	Percussion

Usage: The M18 is a hand-thrown, smoke grenade which emits red or yellow, or violet smoke for 50 to 90 seconds. The M18 may also emit green smoke. These grenades use a pyrotechnic, delay-igniting fuze which provides an approximate 2-second delay.

Description: The M18 grenade may be olive drab with a light green band around the lower body and nomenclature and smoke color stenciled in light green, or light green with stenciled the color of the smoke. The top of the grenade is painted the color of the smoke.

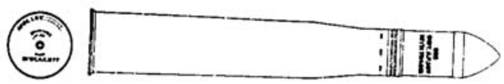
Reference: ORDATA Online

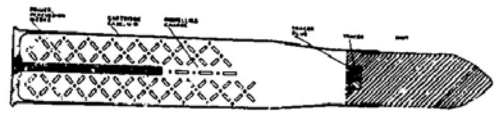
* SMOKE SCREENING. This class of pyrotechnics are generally considered to be nontoxic. The material used in these devices may be HC (a mixture of hexachlorethane, zinc oxide and aluminum), WP (white phosphorous), PWP (plasticized white phosphorous), SGF2 oil (smoke generated fog oil) and RP (red phosphorous). Many of these substances will ignite if exposed to water or to air. The firefighting efforts must take into account the special nature of these materials which

react to water and to air. They can become toxic if used in large amounts in confined spaces.

Ordnance Technical Data Sheet

U.S. PROJECTILE, 90-MM, AP, SHOT, M77





Nomenclature: U.S. Projectile, 90 mm, AP, Shot, M77
Ordnance Family: Projectile
DODIC: Not Provided
Filler: None
Filler weight: Not Provided
Item Weight: Not Available
Propellant: Single Base or Double Base Propellant*
Diameter: 90.00 mm (3.54 in)
Length: Not Provided
Maximum Range: Not Provided
Fuze: None

Usage: As the 90-mm Gun M1 can be used either against aircraft or tanks, the ammunition is adapted to both targets. The Shot M77 is provided for antitank use

Description: Black painted solid projectile with brass rotation band and copper cartridge case.

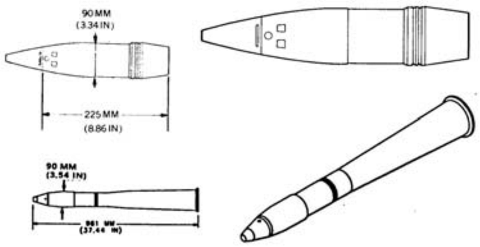
Reference: ORDATA Online.

* **Single Base Propellant:** Single base propellants contain nitro cellulose as their chief ingredient. Single-base compositions are used as low-pressure propellants, such as those used in small arms ammunition. They may contain a stabilizer, inorganic nitrates, nitrocompounds, metallic salts, metals, carbohydrates and dyes.

Double Base Propellant: Double base propellants contain nitrocellulose and a liquid organic nitrate, such as nitroglycerine. As with single base, stabilizers and additives may be present. Double base propellants are used in cannon, small arms, mortars, rockets, and jet propulsion units.

Ordnance Technical Data Sheet

U.S. PROJECTILE, 90-MM, GUN, HE, M71



Nomenclature: U.S. Projectile, 90 mm, Gun, HE, M71
Ordnance Family: Projectile
DODIC: Not Provided
Filler: Composition B*
Filler weight: 975.24 g (2.15 lbs)
Item Weight: Not Provided
Propellant: Double Based Propellant**
Diameter: 90.00 mm (3.54 in)
Length: 225.00 mm (8.86 in)
Maximum Range: Not Provided
Fuze: ET, MT, MTSQ, PD, and PDSD

Usage: Projectiles in this general type category produce their intended effect by blast and/or fragmentation

Description: . HE projectiles are issued either with a nose fuze in place, or with a removable lifting plug or closing plug which is replaced with a nose fuze before firing. Fuze types include ET, MT, MTSQ, PD, and PDSD. These projectiles do not have base fuzes.

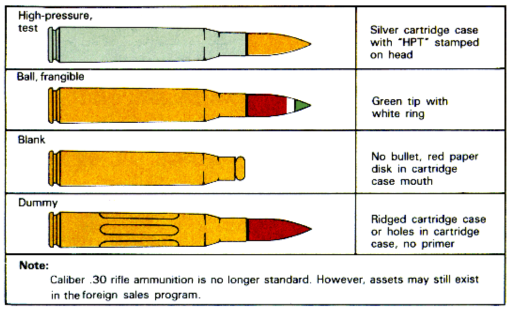
Reference: ORDATA Online.

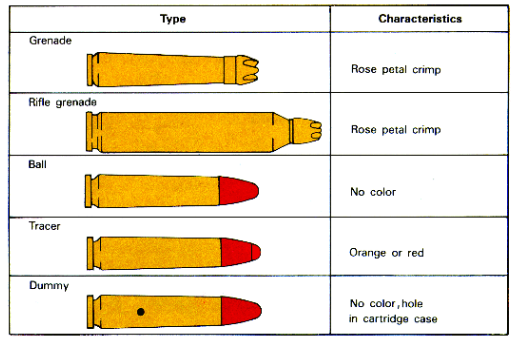
* **Composition B.** Composition B (comp B) is a (59/40/1) mixture of RDX, TNT, and beeswax. Its color may vary from dirty white, light yellow to brownish yellow. Composition B is an authorized filling for Army-Navy (AN) standard aircraft bombs, mines, torpedoes, antitank artillery shells (76- and 105-millimeter), demolition charges, and in rockets.

**** Double Base Propellant:** Double base propellants contain nitrocellulose and a liquid organic nitrate, such as nitroglycerine. As with single base, stabilizers and additives may be present. Double base propellants are used in cannon, small arms, mortars, rockets, and jet propulsion units.

Ordnance Technical Data Sheet

.30 Caliber Ammunition





Caliber .30 Cartridges, Colors and Shapes.

Nomenclature:	U.S. Cartridge .30 Caliber General
Ordnance Family:	Small Arms
DODIC:	Not Provided
Propellant:	Single or Double Base Powder*
Filler:	Mission dependent
Filler weight:	Not Provided
Item Weight:	Various
Diameter:	7.62 mm (.30 in)
Length:	Various
Maximum Range:	Not Provided
Fuze:	Percussion

Usage: Standard Small Arms Ammunition WWII through Korean War.

Description: Normally brass cartridge case with copper encapsulated lead bullet. Bullet tip maybe painted to indicate usage.

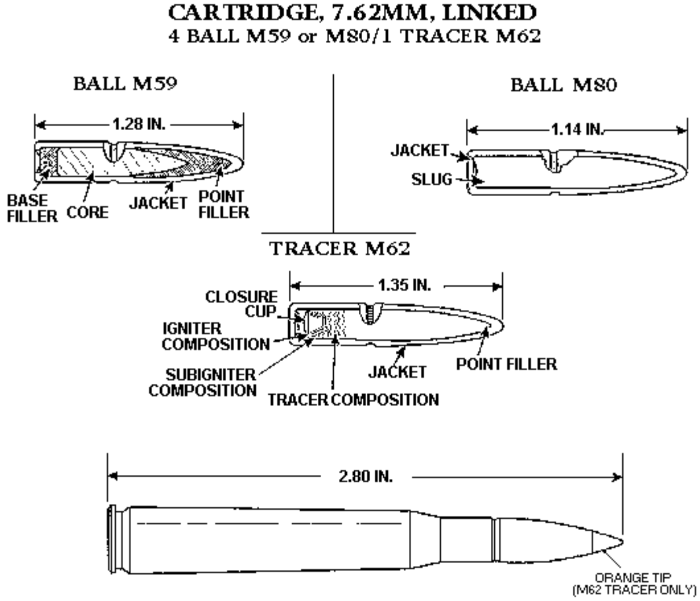
Reference: Army Field Manuel FM-9-13, Ammunition Handbook 4 November 1986.

***Single Base Propellant:** Single base propellants contain nitro cellulose as their chief ingredient. Single-base compositions are used as low-pressure propellants, such as those used in small arms ammunition. They may contain a stabilizer, inorganic nitrates, nitrocompounds, metallic salts, metals, carbohydrates and dyes.

* **Double Base Propellants** contain nitrocellulose and a liquid organic nitrate, such as nitroglycerine. As with single base, stabilizers and additives may be present. Double base propellants are used in cannon, small arms, mortars, rockets, and jet propulsion units.

Ordnance Technical Data Sheet

7.62 MM Small Arms



Nomenclature:	7.62 mm, Small Arms Ammunition
Ordnance Family:	Small Arms
DODIC:	A138
Propellant:	Single or Double Base Powder*
Filler:	Lead and Copper cladding
Filler weight:	Not Provided
Item weight:	376.5 g (13.2 oz)
Diameter:	7.62 mm (.3085 in)
Length:	71.12 mm (2.80 in)
Maximum Range:	Not Provided

Usage: This cartridge is intended for use against personnel and unarmored targets.

Description: Full Metal Jacketed bullet and brass cartridge case, center fired NATO standard small arms.

Reference: ORDATA Online, MIDAS, Army Technical Manuel TM 9-1306-200

***Single Base Propellant:** Single base propellants contain nitro cellulose as their chief ingredient. Single-base compositions are used as low-pressure propellants, such as those used in small arms ammunition. They may contain a stabilizer, inorganic nitrates, nitrocompounds, metallic salts, metals, carbohydrates and dyes.

Double Base Propellant: Double base propellants contain nitrocellulose and a liquid organic nitrate, such as nitroglycerine. As with single base, stabilizers and additives may

be present. Double base propellants are used in cannon, small arms, mortars, rockets, and jet propulsion units.
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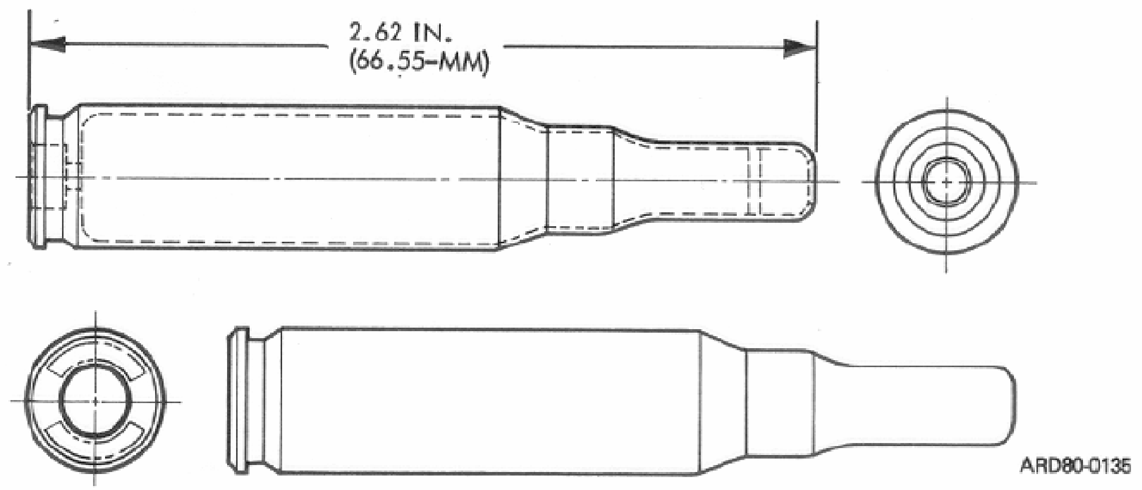
Ordnance Technical Data Sheet
7.62 MM Blank Cartridge



Nomenclature:	7.62 MM Blank Cartridge
Ordnance Family:	Small Arms
DODIC:	1305-A112
Propellant:	Single or Double Base Powder*
Filler:	None
Filler weight:	None
Item weight:	15.23 g (235 gr)
Diameter:	7.62 mm (.308 in)
Length:	66.54mm (2.62 in)
Maximum Range:	N/A

Usage: This cartridge is used in rifles and machineguns equipped with blank firing attachments to simulate firing in training exercises and for saluting purposes.

Description: The cartridge is identified by its double tapered neck and the absence of a bullet.

Reference: Army Technical Manuel TM 43-0001-27

***Single Base Propellant:** Single base propellants contain nitro cellulose as their chief ingredient. Single-base compositions are used as low-pressure propellants, such as those used in small arms ammunition. They may contain a stabilizer, inorganic nitrates, nitrocompounds, metallic salts, metals, carbohydrates and dyes.

Double Base Propellant: Double base propellants contain nitrocellulose and a liquid organic nitrate, such as nitroglycerine. As with single base, stabilizers and additives may

be present. Double base propellants are used in cannon, small arms, mortars, rockets, and jet propulsion units.
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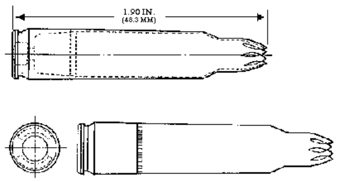
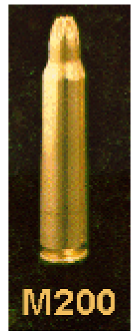
Ordnance Technical Data Sheet

5.56 MM Blank M200



CARTRIDGE, 5.56 MM, BLANK, M200



Nomenclature: CTG 5.56 mm, Blank M200
Ordnance Family: Small Arms
DODIC: A075
Propellant: Single or Double Base Powder *
Filler: None
Filler weight: None
Item weight: Not provided
Diameter: 5.56 mm (.223 in)
Length: 48.3 mm (1.90 in)
Maximum Range: Not Provided

Usage: Training, ceremonial, grenade projection. The blank round is used during training when simulated live fire is desired. An M15A2 blank-firing attachment must be used to fire this ammunition.

Description: The 5.56-mm blank M200 (M2 link, A075) blank cartridge has no projectile. The case mouth is closed with a seven-petal rosette crimp and has a violet tip. The original M200 blank cartridge had a white tip. Field use of this cartridge resulted in residue buildup, which caused malfunctions. Only the violet-tipped M200 cartridge should be used.

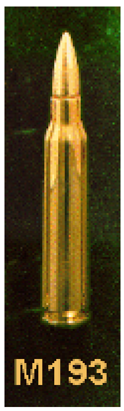
Reference: ORDATA Online, TM 9-1306-200

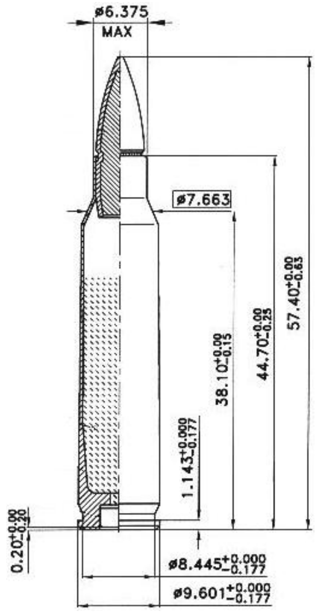
***Single Base Propellant:** Single base propellants contain nitro cellulose as their chief ingredient. Single-base compositions are used as low-pressure propellants, such as those used in small arms ammunition. They may contain a stabilizer, inorganic nitrates, nitro-compounds, metallic salts, metals, carbohydrates and dyes.

Double Base Propellant: Double base propellants contain nitrocellulose and a liquid organic nitrate, such as nitroglycerine. As with single base, stabilizers and additives may be present. Double base propellants are used in cannon, small arms, mortars, rockets, and jet propulsion units.

<u>Ordnance Technical Data Sheet</u>

M855 5.56mm NATO Cartridge





Nomenclature:	CTG5.56 MM
Ordnance Family:	Small Arms Ammunition
DODIC:	A075
Propellant:	Single or Double Base Powder*
Filler:	M855 5.56mm NATO Cartridge
Filler weight:	Various
Item weight:	7.095 g (109.5 gr)
Diameter:	5.56 mm (.2189 in)
Length:	58.42 mm (2.3 in)
Maximum Range:	Not Provided

Usage: This is the NATO standard round. It is effective against personnel and light materials, not vehicles.

Description: The 5.56-mm ball M855 (A059) cartridge has a gilding, metal-jacketed, lead alloy core bullet with a steel penetrator. The primer and case are waterproof. It is identified by a green tip, has a projectile weight of 62 grains, and is 2.3 cm long. This is the NATO standard round. It is effective against personnel and light materials, not vehicles.

Reference: ORDATA Online, Army Technical Manuel TM 9-1306-200

***Single Base Propellant:** Single base propellants contain nitro cellulose as their chief ingredient. Single-base compositions are used as low-pressure propellants, such as those used in small arms ammunition. They may contain a stabilizer, inorganic nitrates, nitrocompounds, metallic salts, metals, carbohydrates and dyes.

Double Base Propellant: Double base propellants contain nitrocellulose and a liquid organic nitrate, such as nitroglycerine. As with single base, stabilizers and additives may be present. Double base propellants are used in cannon, small arms, mortars, rockets, and jet propulsion units.

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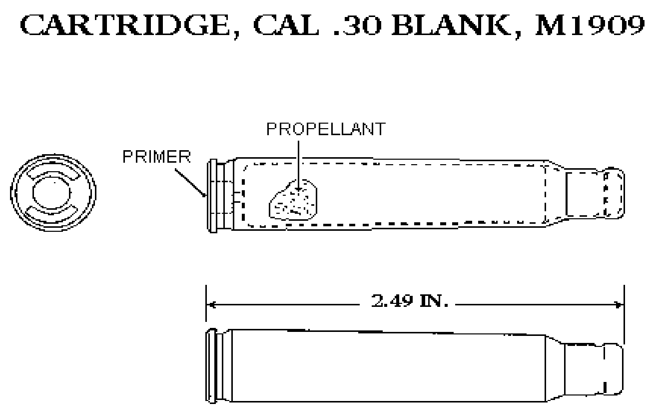
Ordnance Technical Data Sheet
U.S. Cartridge, .30 Caliber, Blank, M1909



Nomenclature:	.30 Caliber, Blank, M1909 Linked M19
Ordnance Family:	Small Arms
DODIC:	A225
Filler:	Single or Double Base Powder*
Filler weight:	Not Provided
Item Weight:	14.13 g (218 gr)
Diameter:	7.62 mm (.30 in)
Length:	63.25 mm (2.49 in)
Maximum Range:	Not Provided
Fuze:	Percussion fired

Usage: Training exercises, ceremonial occasions.

Description: Unpainted brass case 2.49 inches long with crimped closure.

Reference: ORDATA Online, Midas.

***Single Base Propellant:** Single base propellants contain nitro cellulose as their chief ingredient. Single-base compositions are used as low-pressure propellants, such as those used in small arms ammunition. They may contain a stabilizer, inorganic nitrates, nitro compounds, metallic salts, metals, carbohydrates and dyes.

Double Base Propellant: Double base propellants contain nitrocellulose and a liquid organic nitrate, such as nitroglycerine. As with single base, stabilizers and additives may

be present. Double base propellants are used in cannon, small arms, mortars, rockets, and jet propulsion units.
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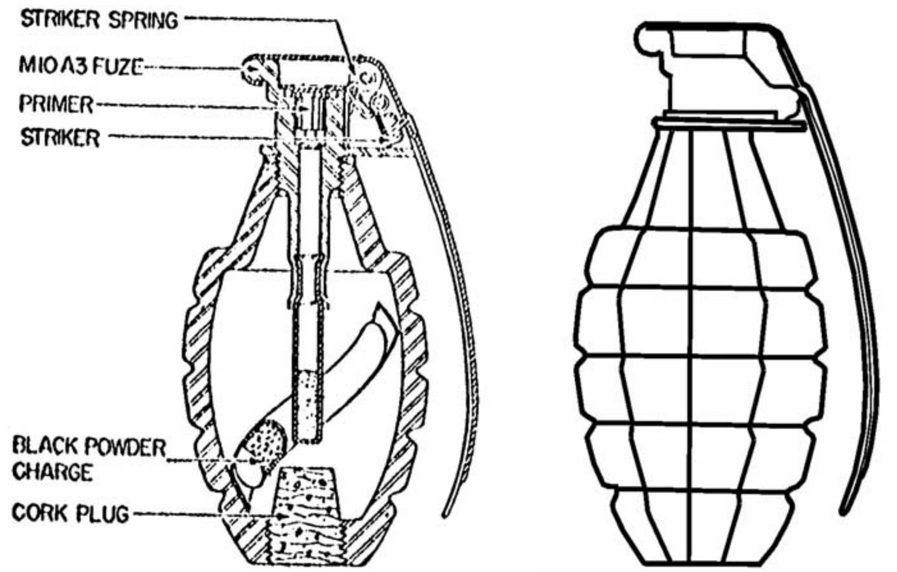
Ordnance Technical Data Sheet

U.S. GRENADE, PRACTICE, MK II(2)



Nomenclature:	U.S. Grenade, Practice, MK II(2)
Ordnance Family:	Grenades
DODIC:	Not Provided
Filler:	Black powder
Filler weight:	28.35 g (1 oz)
Item weight:	580.61 g (20.48 oz)
Diameter:	57.17 mm (2.25 in)
Length:	114.30 mm (4.5 in)
Maximum Range:	Not Provided
Fuze:	Powder train time-delay

Usage: This grenade consists of a fragmentation body with a filing hole in the base, an Igniting Fuze M206, a small charge of black powder, and a cork plug in the filling hole. Extra fuzes, charges, and plugs are supplied separately, so that the grenade body can be reused.

Description: The body is light blue.

Reference: ORDATA Online.

Appendix H: Technical Project Planning Meeting Minutes

MALCOLM PIRNIE

MEETING MINUTES

Purpose: Fort Stewart Military Munitions Response Program Site Inspection Technical Project Planning Meeting
8:00 am – 3:30 pm

Location: Hunter Army Airfield, GA

Date: 12 September 2006

Attendees	Organization
Timothy Rodeffer	Army Environmental Center (AEC)
Alan Freed	AEC Remedial Manager
Kim Gross	US Army Corps of Engineers, Baltimore District Project Manager
Shelly Kolb	Malcolm Pirnie, Inc.
Afton Hess	Malcolm Pirnie, Inc.
Algeana Stevenson	Fort Stewart (FTSW) Department of Public Works (DPW) Environmental
Randy Powell-Jones	Fort Stewart DPW Restoration
Benoit Causse	Georgia Environmental Protection Division (EPD)

Shelly Kolb opened the meeting with a brief overview of the meeting goals and introductions were made around the table. Before the presentation, a discussion on various related topics occurred.

- Algeana provided the inorganic background data for 16 solid waste management units across FTSW, which will be used to screen soil samples collected during the Military Munitions Response Program (MMRP) Site Inspection (SI) field work. Benoit Causse was not working for GAEPD when the report was finalized and therefore will be reviewing the report for his information.

- In order to meet the requirements of FTSW's Resource Conservation and Recovery Act (RCRA) permit, Fort Stewart will need to submit an extension letter containing the scheduled dates for the MMRP SI field work to GAEPD.

- The Munitions Response Sites (MRS or MR site) will be "Areas of Concern (AOC)" in the RCRA program, not "Solid Waste Management Units (SWMU)". A letter reporting the discovery of the AOCs will be submitted to GAEPD to be in compliance with FTSW's RCRA permit. AEC will provide the information and FTSW will send the letter. The letter will be sent after the SI report is finalized and will include all MR sites in the Historical Records Review (HRR) including MR sites where a no further action (NFA) is recommended prior to the SI field work (including Small Arms Range 2). Descriptions of MR sites with a NFA recommendation will include a brief explanation of why the NFA recommendation was made.

- Benoit Causse GAEPD indicated that he will be providing updated appropriate regulatory screening criteria.

The TPP presentation continued with a summary of the HRR results for each MRS. During this summary Benoit Causse GAEPD presented two comments on the Stakeholder Draft HRR. The comments were as follows:

Comment: Section 5 does not contain a conceptual site model (CSM) or munitions constituent (MC) pathway analysis figure for Small Arms Range 2.

Response: The HRR research revealed that Small Arms Range 2 did not overlap the cantonment area and therefore is not eligible for the MMRP. This information is presented in Section 4.6.3 of the HRR report. Text will be added to the introduction text of Section 5 indicating that the MRS is no longer MMRP eligible and therefore a CSM will not be created.

Comment: Figure 5-3 MEC Pathway Analysis Figure depicts an incomplete pathway for receptors to MEC on the surface. Since there has been EOD reports in this area this pathway should be potentially complete.

Response: This change will be made and reflected in the Final HRR.

The following MMRP SI field activities and outcomes were discussed and agreed upon during the TPP meeting:

MRS	Munitions of Explosive Concern (MEC) SI Activities		
	Activity	Purpose	Notes
Anti-Aircraft Range -1	Limited magnetometer assisted visual survey during sampling activities.	Support MEC NFA or further investigation under the RCRA program (equivalent to remedial investigation (RI)). NFA if no MEC is encountered on the surface. RI if MEC is encountered on the surface.	Site is well maintained/mowed so MEC or munitions debris on the surface is not expected.
Anti-Aircraft Range 90mm - 2	None	Further investigation under the RCRA program (equivalent to RI) is recommended for the MRS.	Recommendation is based on historical evidence of multiple overlapping range fans and multiple EOD responses.

MRS	Munitions of Explosive Concern (MEC) SI Activities		
	Activity	Purpose	Notes
Anti-Tank Range 90mm	Document historical use in Installation Master Plan	NFA is recommended for the MRS.	Recommendation based on current/future use as a RCRA permitted landfill.
Hand Grenade Course	Limited magnetometer assisted visual survey during sampling activities[1].	Further investigation under the RCRA program (equivalent to RI) is recommended for the MRS.	Recommendation based on historical evidence of multiple overlapping range fans and multiple EOD responses.
Hero Road Trench	Conduct a visual survey of unfenced portions of MRS to ensure no MEC or MEC debris remains on the surface.	Further investigation under the RCRA program (equivalent to RI) is recommended for the MRS.	Recommendation based on historical evidence and results of current investigation.
Small Arms Range - 1	N/A	small arms only	No MEC is associated with small arms use.
Small Arms Range - 3	N/A	small arms only	No MEC is associated with small arms use.
1 MEC field activities for the former Hand Grenade Course were updated after the TPP meeting minutes were finalized due to a previously unrecognized error. Discussions during the TPP meeting included visual survey activities during sampling activities.			

MRS	Munitions Constituents (MC) SI Activities		
	Activity	Purpose	Notes
Anti-Aircraft Range -1	Collect 4 composite surface soil samples at random locations or biased locations if MEC is encountered. Analyze sample for explosives and metals using EPA Methods 8330 and 6010B/6020.	To support CTC and Prioritization Protocol and to support MC NFA or further investigation under the RCRA program (equivalent to RI). The data will be screened using a background data and residential PRGs.	MRS is overlapped by a buffer area of the range fan, near the firing point. Potential munitions that were used are 37mm, 40mm, 90mm anti-aircraft guns. No EOD responses have been reported. The land is currently a Parade Field Associated with the NCO Academy; the field is maintained.
Anti-Aircraft Range 90mm - 2	Collect 1 composite surface soil sample. Analyze sample for explosives and metals using EPA Methods 8330 and 6010B/6020.	To support CTC and Prioritization Protocol and to support MC NFA or further investigation under the RCRA program (equivalent to RI). The data will be screened using a background data and residential PRGs.	The potential munitions used are 40mm, 90mm Anti-Aircraft Projectiles. Tank range munitions are unknown. Several EOD responses have been reported involving C-4 plastic explosives, M-222, GM Dragon Missiles, M-7, MK-2 fragmentation hand grenade. The current and future land use is an Ammunition Supply Point.

MRS	Munitions Constituents (MC) SI Activities		
	Activity	**Purpose**	**Notes**
Anti-Tank Range 90mm	None	NFA is recommended for the MRS. Historic use should be documented in the Master Plan.	The potential munitions use: 90mm, 40mm, 37mm, and various small arms. One EOD response involving an M-7 grenades and an MK-2 fragmentation grenade. MRS is currently an active RCRA permitted landfill. Recommendation based on current/future use.
Hand Grenade Course	Collect 1 biased composite surface soil sample at one of the EOD response locations. Analyze sample for explosives and metals using EPA Methods 8330 and 6010B/6021.	To support CTC and Prioritization Protocol. Further investigation under the RCRA program (equivalent to RI) is recommended for the MRS. The data will be compared to background data and residential PRGs	The potential munitions uses are hand grenades (type unknown), 90mm, 40mm, 37mm, and various small arms. One EOD response reported involving M-7 grenades and an MK-2 fragmentation grenade. The land is currently undeveloped. Recommendation is based on historical evidence of multiple overlapping range fans and multiple EOD responses.
Hero Road Trench	Collect 1 composite surface soil sample. Analyze sample for explosives and metals using EPA Methods 8330 and 6010B/6021.	To support CTC and Prioritization Protocol. Further investigation under the RCRA program (equivalent to RI) is recommended for the MRS. The data will be compared to background data and residential PRGs.	The potential Munitions Use are 5% solution of mustard gas, 5% solution of Lewisite, 50% solution of chloropicrin, pure agent phosgene. No EOD responses reported. MRS is currently fenced and undeveloped and is located adjacent to the Family Housing Maintenance Parking Lot. Recommendation is based on historical evidence and results of current investigation.
Small Arms Range - 1	Collect 4 composite surface soil samples in the undeveloped portions (~41 acres) of the site. Analyze sample for lead by EPA Method 6020.	To support CTC and Prioritization Protocol and to support MC NFA or further investigation under the RCRA program (equivalent to RI). The data will be screened using background data and residential PRG.	The site is overlapped by the firing point but the firing point is a paved heliport pad. The potential munitions used are various small arms. No EOD responses reported. The current land use is Evans's Airfield/Heliport.

MRS	Munitions Constituents (MC) SI Activities		
	Activity	Purpose	Notes
Small Arms Range - 3	Collect 2 sediment, 2 surface water and 3 composite surface soil samples. Soil samples: 1 in northern and 2 in the southern portions. Sediment samples: 1 on each of the man-made damns of the pond. Analyze samples for lead by EPA method 6020*	To support CTC and Prioritization Protocol and to support MC NFA or RI determination. The data will be screened using a background study and residential PRG for lead.	Potential munitions used are various small arms. No EOD responses reported. The current land use is undeveloped and Hallbrook Pond Recreational Area.
*MC field activities updated after MRS tour.			

After the presentation the team broke for lunch and traveled to Fort Stewart where a tour of each MRS was conducted. The following are notations from the specific sites.

Site Tour

<u>Small Arms Range 1/Evans Airfield/Helliport</u>

- This area is diagonal to SWMU 29
- The north portion grass-covered and mowed
- The south portion is mostly paved with grass covered areas and shrubs
- Samples should be taken in grass-covered areas.

<u>Small Arms Range 3/Hollbrook Pond</u>

- Site contains a manmade pond that was built in 1966
    - About 20 acres
    - Average of 6 feet in depth
    - Alligators live are present in pond
- Earthen dam is along boundary
- Benoit Causse GAEPD requests that two sediment and two surface water samples be added to the field activities for the site since pond was build after historic use.
- Sediment and surface water and sediment samples should be collected along each side man made of the dam. This is in addition to the three soil samples discussed during the presentation (this was added to the table above).
- The pond is stocked with bass, and catfish

Hero Road Trench Area

- Building 7808 and a housing area are located near the MRS
- Entire MRS does not appear to be fenced.
- Visual survey of MRS should be used to also determine bounds of trench and fill landfill if possible.

Anti-Aircraft Range 2

- MRS includes a combination of mowed grass and wooded areas

Anti-Tank Range

- This MRS was not included in the tour since it is a RCRA permitted landfill Benoit Causse GAEPD did not need to see it.

Anti-Aircraft Range - 1

- This area is completely mowed and maintained and samples should be widely disbursed across the MRS.

Meeting Generated Action Items

- Benoit Causse GAEPD will provide acceptable updated regulatory screening criteria for screening for various sampling media via email.
- Algeana will obtain actual GIS layer of fence for Hero Road Trench Area.
- The Final HRR will be distributed early based on comment received from Benoit Causse GAEPD.

MALCOLM PIRNIE

MEETING MINUTES

Purpose: Fort Stewart Military Munitions Response Program (MMRP) Site Inspection Technical Project Planning Meeting II
2:00 pm – 4:30 pm

Location: Fort Stewart, GA

Date: 31 July 2007

Attendees	Organization
Timothy Rodeffer	Army Environmental Command (AEC)
Alan Freed	AEC Environmental Restoration Manager
Kim Gross	US Army Corps of Engineers, Baltimore District Project Manager
Shelly Kolb	Malcolm Pirnie, Inc.
David Smith	Malcolm Pirnie, Inc.
Algeana Stevenson	Fort Stewart (FTSW) Department of Public Works (DPW) Environmental
Tressa Rutland	Fort Stewart (FTSW) Department of Public Works (DPW) Environmental
Randy Powell-Jones	Fort Stewart DPW Restoration
A. Mohammad Ghazi	Georgia Environmental Protection Division (EPD)

Shelly Kolb opened the meeting with a brief overview of the meeting goals and introductions were made around the table. During the presentation, a discussion on various related topics occurred.

- Algeana Stevenson asked if the Munitions Response Site Prioritization Protocol (MRSPP) Notification requirement was covered by the RCRA permit notification requirement. Tim Rodeffer explained that the requirement is not fulfilled by the RCRA permit because the MRSPP notification requirement is a separate unrelated requirement.
- Fort Stewart is in the process of updating RCRA Permit (review period ended day of meeting). Based on the findings, conclusions, and recommendations of the CS Report the Installation would like to remove all of the MMRP sites from the Permit application and resubmit based on final recommendations at a later date. Their desire to do this is based on several factors:
    - Three of the seven Munitions Response Sites (MRSs) were found to be ineligible for the MMRP due to ongoing training activities. As such no action will be taken as part of the MMRP.
    - The response schedule for the MMRP is no compatible with the expected RCRA response schedule, which would require the

installation to write multiple letter requests for schedule extensions several times a year.

- Mohammad Ghazi GAEPD stated that he has not had an opportunity to review the document and is unsure how much time he'll need.

The following MMRP CS Recommendations were discussed and agreed upon during the TPP meeting:

MRS	CS Recommendation	Basis for Recommendation	
		MEC	MC
Anti-Aircraft Range - 1	Not eligible for MMRP	Based on the evidence of recent munitions related training (after September 2002) observed during the field activities this MRS is not eligible for the MMRP.	
Anti-Aircraft Range 90-mm - 2	RFI/CMS	As agreed upon during the TPP meeting, this MRS is recommended for further investigation (RFI/CMS) based on historical evidence of multiple overlapping range fans and multiple explosive ordnance disposal calls.	
Anti-Tank Range 90-mm	Not eligible for MMRP	As agreed upon during the TPP meeting, continued monitoring under the current RCRA landfill permit is recommended.	
Hand Grenade Course	Not eligible for MMRP	Based on information obtained from the Range Control Range Officer, the Hand Grenade Course is located within the footprint of an operational small arms range impact area and as such this MRS is not eligible under the MMRP.	
Small Arms Range - 1	Not eligible for MMRP	Based on the evidence of recent munitions related training (after September 2002) observed during the field activities this MRS is not eligible for the MMRP.	
Small Arms Range - 3	NFA	Recommend NFA based on historical evidence that only small arms were used on site.	Recommend NFA based on analytical results of soil samples not exceeding the FTSW background values for inorganic compounds. Additionally, the analytical results of sediment and surface water samples did not exceed selected screening criteria.
Hero Road Trench Area	RFI/CMS	As agreed upon during the TPP meeting, this MRS is recommended for further investigation (RFI/CMS) based on information presented in the HRR regarding alleged burials of Chemical Agent Identification Sets Detonation, M1.	

- The following site specific discussions/clarifications regarding the recommendations were discussed during the meeting:
    - Anti-Aircraft Range 90-mm – 2: given the use of the parcel [Ammunition Supply Point (ASP) supporting operational training] is a candidate for reverting back to Operational training area. This would render the area not eligible for the MMRP. AEC has seen other ASPs designated as both operational and non-operational. The installation would like for AEC to provide examples to use to support the conversation with range control.
    - Hero Road Trench Area: During the CS field activities the current boundary of the MRS was discussed. The boundary was based on the footprint of the GPR survey that was completed on the MRS. It does not include the entire fenced portion of the area. Additionally, what appeared to be trenches were observed in the southern un-fenced area. Based on these changes to the boundary, to include the entire fenced portion and potentially the southern portion. Before the boundary is altered, Malcolm Pirnie will review the GPR survey, and attempt to get additional information regarding the unfenced area from installation personnel (related to the landfill or recent excavations).
    - The “no further action” recommendation made for sites that are not eligible for the MMRP should be changed to state the sites are not eligible for the MMRP.
    - The format for the MRSPP has changed (simplified) slightly. The updated MRSPP tables will be forwarded to Mohammad Ghazi GAEPD for his review.

Meeting Generated Action Items

- Installation will notify the stakeholders of MRSPP as required. This includes a public announcement in a local newspaper and a letter to the GAEPD.
- Malcolm Pirnie will send an electronic copy of the updated MRSPP to GAEPD to expedite the review process.
- GAEPD will review and provide comments on CS Report and MRSPP.
- Tim Rodeffer will research other Installations regarding the categorization of ASP’s as operational land or non operational land.
- Algeana Stevenson will contact Jim Pearson of the Range control office to inquire about the possible transformation of the ASP at the Anti-Aircraft Range 90-mm – 2 to operational land.
- Regarding the potential revisions of the boundary of the Hero Road Trench Site Algeana Stevenson will visit the site to see the areas that appeared to be trenches in the unfenced portion of the MRS to determine if they are related to storm water runoff.