FINAL

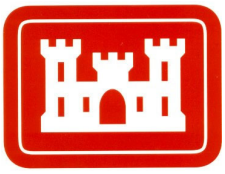
DECISION DOCUMENT

FORMER CAMP CROFT

105mm AREA

SPARTANBURG, SOUTH CAROLINA

FUDS PROJECT NUMBER I04SC001610



Prepared by:

U.S. Army Corps of Engineers

September 2020

EXECUTIVE SUMMARY

ES.1 This Decision Document presents the selected remedy for the Munitions Response Site 10: 105mm Area, which is located within the Camp Croft Formerly Used Defense Site Property Number I04SC0016, in Spartanburg, South Carolina. The Munitions Response Site 10: 105mm Area is designated as Formerly Used Defense Site Project I04SC001610.

ES.2 Munitions Response Site 10: 105mm Area is comprised of approximately 1,399.7 acres and includes private properties and a small portion of Croft State Park.

ES.3 The remedial action objective is to reduce the unacceptable risk due to the presence of munitions and explosives of concern within Munitions Response Site 10 to a depth of 3 feet below ground surface to address the possibility of exposure to residents, workers, visitors, and recreational users such that an acceptable condition of negligible risk is achieved. Department of Defense military munitions, some of which may be determined upon evaluation by qualified personnel (i.e., explosive ordnance disposal and unexploded ordnance qualified personnel) to be munitions and explosives of concern, have been determined to be present within Munitions Response Site 10. The selected remedy is chosen to satisfy the remedial action objective. In developing the remedial action objective, current and future land uses were considered.

ES.4 The selected remedy for Munitions Response Site 10 is a modified Alternative 3, Advanced Geophysical Classification and Analog Supported Surface and Subsurface Munitions Removal and Land Use Controls including Implementation of a Recognize, Retreat and Report Explosive Safety Education Program, and further items identified in Table 2-5. This remedy includes removal of munitions visible on the ground surface; investigating identified subsurface anomalies and removing all targets of interest; informing the public of the actions to take should they encounter or suspect they have encountered a munition; posting of awareness signs; and distributing the Recognize, Retreat and Report Explosive Safety Education Program materials. Alternative 3, as selected, was modified from the version presented in the Proposed Plan based on comments and responses to the Proposed Plan.

ES.5 The selected remedy is protective of human health and the environment and is cost effective. The estimated present worth cost for implementing the selected remedy at Munitions Response Site 10 is approximately $61,930,701.

ES.6 Other munitions response actions were considered and evaluated against the nine criteria presented in the National Oil and Hazardous Substances Pollution Contingency Plan. The alternatives included 1) No Action; 2) Land Use Controls, including Public Education, and Long-Term Management; 3) Advanced Geophysical Classification and Analog Supported Surface and Subsurface Munitions Removal and Land Use Controls including Implementation of a Recognize, Retreat and Report Explosive Safety Program; and 4) Digital Advanced Classification Supported Surface and Subsurface Munitions Removal to support unlimited use/unrestricted exposure. Both the No Action and Land Use Controls including Implementation of a Recognize, Retreat and Report Explosive Safety Program alternatives were considered but it was determined that they are not protective of human health. The Advanced Geophysical Classification and Analog Supported Surface and Subsurface Munitions Removal and Land Use Controls including Implementation of a Recognize, Retreat, and Report Explosive Safety Education Program would support current and future anticipated land use.

Digital Advanced Classification Supported Surface and Subsurface Munitions Removal to Support unlimited use/unrestricted exposure is unachievable because of trees, terrain, structures and infrastructure at the site which will not allow for unlimited use/unrestricted exposure to be achieved. This analysis is based on the results of the Remedial Investigation fieldwork, where there was physical evidence (e.g., munitions and munitions debris) of munitions use within Munitions Response Site 10. Munitions constituents were determined not to pose an unacceptable risk to human health and the environment. As such, no further action is necessary for munitions constituents.

ES.7 The selected remedy is protective of human health and the environment for current and reasonably anticipated future land use activities. The United States Army Corps of Engineers concludes that implementation of the selected remedy over the entirety of Munitions Response Site 10 will result in an acceptable risk scenario allowing for current and future land use; a Recognize, Retreat and Report Explosive Safety Education Program will be implemented and statutory reviews will begin within five years.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABBREVIATIONS AND ACRONYMS

3Rs	Recognize, Retreat and Report Explosive Safety Education
AGC	Advanced Geophysical Classification
AoPI	Area of Potential Interest
ARAR	Applicable or Relevant and Appropriate Requirements
ASR	Archives Search Report
bgs	Below Ground Surface
BIP	Blow-in-Place
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CESAC	U.S. Army Corps of Engineers, Charleston District
CFR	Code of Federal Regulations
DD	Decision Document
DHEC	Department of Health and Environmental Control
DoD	Department of Defense
EE/CA	Engineering Evaluation/Cost Analysis
EPA	Environmental Protection Agency
FS	Feasibility Study
FUDS	Formerly Used Defense Sites
HA	Hazard Assessment
IRTC	Infantry Replacement Training Center
LTM	Long-term Management
LUC	Land Use Controls
MC	Munitions Constituent
MD	Munitions Debris
MEC	Munitions and Explosives of Concern
mm	millimeter
MMRP	Military Munitions Response Program
MRS	Munitions Response Site
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
OOU	Ordnance Operable Unit
RAB	Restoration Advisory Board
RAO	Remedial Action Objective
RI	Remedial Investigation
RI/FS	Remedial Investigation/Feasibility Study
SC	South Carolina
TCRA	Time Critical Removal Action
USACE	United States Army Corps of Engineers
USC	United States Code
UU/UE	Unlimited Use/Unrestricted Exposure
UXO	Unexploded Ordnance
XRF	X-ray Fluorescence

1.0 PART 1: THE DECLARATION

1.1 PROJECT NAME AND LOCATION

Munitions Response Site (MRS) 10:105mm Area is located within the former Camp Croft Formerly Used Defense Site (FUDS), Property Number I04SC0016 and is designated as FUDS Project I04SC001610: 105mm Area. The Camp Croft FUDS is located approximately 10 miles southeast of Spartanburg, South Carolina (SC) as shown on Figure 2-1.

1.2 STATEMENT OF BASIS AND PURPOSE

1.2.1 The U.S. Army is the lead agency on behalf of the Department of Defense (DOD), and the United States Army Corps of Engineers (USACE) has mission execution authority for the FUDS Program. The USACE is providing this Decision Document (DD) to describe the DoD's selected remedy for the FUDS Project I04SC001610: 105mm Area, Former Camp Croft, Spartanburg, SC.

1.2.2 DoD selected the remedy for MRS 10 in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 United States Code (USC) § 9601 et seq., as amended, and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 Code of Federal Regulations (CFR) Part 300. The SC Department of Health and Environmental Control (DHEC) reviewed the Proposed Plan (PP) and provided comments. These comments and USACE's responses are provided in Part 3: The Responsiveness Summary. The PP was also made available for public review and comment, but no comments were received. The Administrative Record provides supporting documentation for this decision.

1.3 ASSESSMENT OF FUDS PROJECT I04SC001610

Historical information related to the use of the Camp Croft Infantry Replacement Training Center (IRTC) indicated the potential for DoD military munitions (munitions) to be present within the acreage that makes up MRS 10. Prior investigations and removal actions encountered munitions that upon evaluation were determined to be munitions and explosives of concern (MEC) and extensive amounts of munitions debris (MD). The presence of MEC and MD indicated the DoD used MRS10 for live-fire training. As such, it is possible that the public may encounter munitions within this site. The selected remedy is necessary to protect human health and the environment from the hazards associated with the potential presence of munitions.

1.4 DESCRIPTION OF SELECTED REMEDY

1.4.1 The selected remedy for MRS 10 is AGC and Analog supported Surface and Subsurface Munitions Removal and Land Use Controls including Implementation of a Recognize, Retreat and Report Explosive Safety Education (3Rs) Program. This remedy involves the following:

- Funding and implementation by USACE;
- Informing the public of the actions to take should they encounter or suspect they have encountered a munition;
- Posting of awareness signs;
- Distributing 3Rs Program informational material;

- Removing munitions visible on the ground surface; and
- Investigating selected subsurface anomalies identified by analog/digital sensors to 3 feet, and removing to that depth based upon those investigations.
- Preferential use of Digital Advanced Classification where technically feasible, excluding footprints of large trees, building, and permanent structures, concrete and asphalt pads and roads, water features greater than 1-foot depth, and terrain and slopes deemed a safety risk.

1.4.2 USACE will implement this remedy.

1.5 STATUTORY DETERMINATIONS

1.5.1 In accordance with the CERCLA §121 and the NCP, the selected remedy is protective of human health and the environment; complies with Federal and State requirements that are applicable or relevant and appropriate to the remedial action; is cost effective; and uses permanent solutions and alternative treatment technologies to the maximum extent practicable. This remedy also satisfies the statutory preference for treatment as a principal element of the remedy (i.e., reduces the toxicity, mobility, or volume of munitions that may remain present).

1.5.2 It is anticipated that the outcome of the remedy will not support unlimited use/unrestricted exposure (UU/UE); therefore, a statutory review within five years after initiation of the remedial action and every five years thereafter if UU/UE is not achieved, will be required and a 3Rs Program will be implemented to achieve an acceptable risk scenario.

1.6 DATA CERTIFICATION CHECKLIST

1.6.1 The below information is included in this DD's Summary. Additional information can be found in the Administrative Record file.

- Munitions and MEC suspected to be present;
- Baseline hazard posed by MEC that may remain present;
- Description of how munitions determined to be MEC will be treated;
- Assumptions made concerning the current and reasonably anticipated future land uses;
- Total present worth costs and the number of years over which the remedy cost estimates are projected; and
- Key factors considered in selecting the remedy.

1.6.2 The risk assessment concluded that the potential for adverse risks to human health or ecological receptors from exposure to munitions constituents (MC) in soil or sediment are considered negligible at the Camp Croft FUDS. No action is necessary for MC. As such, the following information is not included in this DD:

- MC and their respective concentrations;
- Baseline risk represented by the MC;
- Cleanup levels established for MC and the basis for these levels;
- How MC will be addressed; and
- Current and potential beneficial uses of groundwater used in the baseline assessment.

1.7 AUTHORIZING SIGNATURES

This DD presents the determination for the CERCLA remedial response action needed for FUDS Project I04SC001610: 105mm Area (MRS 10). The U.S. Army is the lead agency at the Camp Croft FUDS under the Defense Environmental Restoration Program (DERP) and USACE has mission execution authority for the FUDS Program. USACE has developed this DD consistent with the CERCLA, as amended, and the NCP. This DD will be incorporated into the Administrative Record file for the Camp Croft FUDS, which is available for public view at the Spartanburg County Public Library, 151 South Church Street, Spartanburg, SC 29306. This document, presenting AGC and Analog Supported Surface and Subsurface Munitions Removal and Land Use Controls including Implementation of a 3Rs Program with a present worth cost of $61,930,701 is approved by the undersigned, pursuant to the CEMP-CED (200-1a) Memorandum, "Re-delegation of Assignment of Mission Execution Functions Associated with Department of Defense Lead Agent Responsibilities for the Formerly Used Defense Sites Program," dated 10 August 2019.

APPROVED:

Date: 26 SEP 2024

JEFFREY L. MILHORN
Major General, U.S. Army
Deputy Commanding General
for Military and International Operations

2.0 PART 2: THE DECISION SUMMARY

2.1 PROJECT NAME, LOCATION, AND BRIEF DESCRIPTION

2.1.1 The Camp Croft FUDS is located in northwest SC, less than 10 miles southeast of downtown Spartanburg, SC. Between 1941 and 1944, the United States acquired 19,044.46 acres, comprising 19,039.04 acres in fee, 5.42 acres in easement interests, six no-area easements, and two no-area licenses. Acquisition was accomplished by condemnation. Prior to DoD's use, the land was used for a mix of woodlands, farms, and private residences. DoD declared the entire installation (just over 19,000 acres) surplus in November 1946, and subsequently excessed it in 1947. One of the most significant conveyances was approximately 7,054 acres conveyed by quitclaim deed to the SC Commission of Forestry. USACE has determined that the Camp Croft State Park (formerly known as the Croft State Natural Area) is eligible for the FUDS program. The Military Munitions Response Program Remedial Investigation (RI) for the Camp Croft FUDS was conducted under MRS 03 which, at the time, consisted of 12,337 acres. Based on evidence of munitions contamination, the RI investigation area was expanded to a total of approximately 13,295 acres. The area was delineated in the RI Report to divide the original MRS 03 into 10 separate MRS's, including MRS 10.

2.1.2 USACE is providing this DD to describe DoD's determination of the selected remedy for MRS 10. The Secretary of Defense designated the Secretary of the Army as the Lead Agent for FUDS, regardless of which DoD component previously owned or used the property. The Secretary of the Army delegated program oversight to the Assistant Secretary of the Army for Installations, Energy and the Environment, and program management and mission execution authority to USACE. USACE has authority for investigating, reporting, evaluating, and implementing remedial actions at the Camp Croft FUDS. The regulatory agency for this project is the SC DHEC.

2.1.3 MRS 10 (1399.7 acres) is comprised of privately owned land and a portion of Croft State Park (including the Whitestone Spring). Much of the area is wooded, open land. Several residences are located on the privately-owned portion of the MRS, most of which have infrastructure such as barns and several small ponds. The area is relatively flat to gently rolling topography. Vegetation type and density vary based on current land use from heavily wooded to open land used for agricultural or residential.

2.2 PROJECT HISTORY

Camp Croft IRTC was officially activated on 10 January 1941 and consisted of two general areas: a series of operational ranges; and a non-range area, including troop housing for 20,000 trainees and support personnel; and attached administrative headquarters. Camp Croft served as one of the Army's principal IRTCs; approximately 250,000 soldiers were trained at the facility. Camp Croft was also a prisoner-of-war camp during World War II.

2.3 PREVIOUS INVESTIGATIONS AND REMOVAL ACTIONS

Since the early 1990s, the Army has conducted a number of munitions responses (e.g., investigations, removal actions) at various locations within the former Camp Croft property. These areas, which are identified in various ways based on munitions response actions implemented, are summarized below.

2.3.1 On-site Survey

In August 1984, USACE's Charleston District (CESAC), Environmental and Real Estate Divisions, conducted the earliest known investigation (i.e., a site survey) at the Camp Croft FUDS. USACE's survey determined that DoD did not have a building demolition and debris removal responsibility at the Camp Croft FUDS. However, USACE recommended additional investigation for munitions, including MC-related contamination based on interviews revealing that unexploded ordnance (UXO) was most likely present on the surface and in the subsurface.

2.3.2 Preliminary Assessment

USACE's CESAC performed a Preliminary Assessment issuing a Findings and Determination of Eligibility (FDE), which was dated 25 November 1991. The former Camp Croft FUDS was determined to be FUDS-eligible as a result of that assessment. In 1993, USACE's Rock Island District conducted an Archives Search Report (ASR) that covered the following potential FUDS: (a) Training Range Impact Area A; (b) Gas Chambers/Gas Obstacle Course Area D; (c) Cantonment Area B; and (d) Grenade Court Area B. MRS 10 is part of Training Range Impact Area A.

2.3.3 Phase I Engineering Evaluation/Cost Analysis and Removal Actions

A Time Critical Removal Action (TCRA) was conducted in 1995 over a 30-acre portion of Ordnance Operational Units (OOU) designated OOU6. One 105mm projectile, one explosive burster from a white phosphorous projectile, and two 60mm HE mortars were recovered during the TCRA. A Phase I Engineering Evaluation/Cost Analysis (EE/CA) was conducted in 1996. Nine OOUs were investigated, of which OOU6 is located in MRS 10. MEC and MD were found during the Phase I EE/CA and a removal action on a small area was recommended. A removal action was conducted in 1997 that failed the government's quality assurance inspection. Removal actions were conducted in 1999 and 2001 to complete the 1997 removal action at OOU6 including mechanically removing and sifting the top layers of soil in 4.13 acres. Seven unexploded ordnance (UXO) items were unearthed and detonated.

2.3.4 Additional Actions

An ASR Supplement was prepared in 2004 focusing on the 12 operational ranges at Camp Croft FUDS and the munitions used there.

2.3.5 Remedial Investigation

2.3.5.1 USACE conducted RI fieldwork at the Camp Croft FUDS between January and October 2012. The RI, which characterized the nature and extent of munitions and MC-related contamination, included an ecological and human health risk assessment. USACE conducted the RI for the former MRS 1 (see Table 2-1, below), portions of former MRS 3, Area of Potential Interest (AoPI) 8, AoPI 9E, AoPI 10A, AoPI 10B, and AoPI 11C. Areas for which property owners denied rights-of-entry included former MRS 2 and portions of former MRS 3, AoPI 3, AoPI 5, AoPI 9G, AoPI 11B, and AoPI 11D. During the RI, USACE removed 39 UXO, a discarded military munition, and approximately 2,900 pounds of MD.

2.3.5.2 Munitions and related debris (e.g., MD, range-related debris) are present in many locations across the Camp Croft FUDS. Historical evidence USACE collected during previous munitions responses were combined with the RI's findings to develop a comprehensive understanding of the nature and extent of munitions and MC.

2.3.5.3 Based on the findings of the RI, MRS 3 - 105mm Area was delineated as FUDS Project I04SC001610: 105mm Area. Table 2-1 presents the revised designation. Those highlighted are included in the DD and shown on Figure 2-2.

2.3.5.4 MRS10:105mm Area – MEC (60mm and 81mm mortars, 105mm projectiles, M1 mine, grenades, and undifferentiated fragments) and MD have been found in previous investigations of this area. Extremely high concentrations of MD (60mm and 81mm mortars, 105mm projectiles, M1 mine, grenades, and undifferentiated fragments) in excess of 20,000 items per acre were found during the RI. No MEC were encountered during the RI.

TABLE 2-1 PROJECT DELINEATIONS

Pre-RI Designation	Revised Designation	Decision Document Delineation
MRS 1	MRS 1	MRS 12: Gas Chamber and Cantonment AoPIs
MRS 2	MRS 2	MRS 13: Grenade Court
MRS 3 (Land)	105mm Area	MRS 10: 105mm Area
	Maneuver Area	MRS 07: Maneuver Area/Croft State Park
	60mm Mortar Area	MRS 11: 60mm Mortar Area
	60/81mm Mortar Area	MRS 08: 60/81mm Mortar Area
	Rocket & Rifle Grenade Area	MRS 06: Rocket and Rifle Grenade Area
	Rocket/Grenade Maneuver Area	MRS 03: Munitions Debris Area
	Remaining Lands	MRS 05: Range Complex Remaining Lands
AoPI 3	Grenade Area	MRS 03: Munitions Debris Areas
AoPI 5	AoPI 5	MRS 12: Gas Chamber and Cantonment AoPIs
AoPI 8	AoPI 8	MRS 12: Gas Chamber and Cantonment AoPIs
AoPI 9E	AoPI 9E	MRS 12: Gas Chamber and Cantonment AoPIs
AoPI 9G	AoPI 9G	MRS 12: Gas Chamber and Cantonment AoPIs
AoPI 10A	Rocket Area	MRS 03: Munitions Debris Area
AoPI 10B	Grenade Maneuver Area	MRS 09: Grenade Maneuver Area
AoPI 11B		
AoPI 11C	Practice Grenade Area	MRS 03: Munitions Debris Area
AoPI 11D	Mortar/Rifle Grenade Area	MRS 03: Munitions Debris Area

2.4 ENFORCEMENT ACTIONS

There have been no enforcement actions issued for MRS 10.

2.5 COMMUNITY PARTICIPATION

2.5.1 The Public Involvement Plan, prepared in August 2011, facilitates dialogue between the USACE and residents of the surrounding community regarding the Remedial Investigation/Feasibility Study (RI/FS) at the former Camp Croft. The Administrative Record contains information on the site history, meeting transcripts, historical documents, and project deliverables.

2.5.2 The Restoration Advisory Board (RAB), which was formed in 1996 to increase public awareness and encourage open communication with the community, is still active. From its inception through April 2019, the RAB has met 74 times.

2.5.3 The RI Report, Feasibility Study (FS) Report, and PP for the Camp Croft FUDS were made available to the public for comment and are available at the Spartanburg County Public Library, Spartanburg, SC as well as on the project website. A public meeting to present the PP was held at the Spartanburg Marriott Renaissance Hotel, Spartanburg, SC on 24 March 2016. The PP was available at the meeting and in the Information Repository. The notice of the public meeting and availability of the PP for public comment was published on 15 March and 20 March 2016 in the Spartanburg Herald-Journal. In addition, meeting announcement cards were sent to more than 500 local residents and property owners. The PP was also presented at the RAB meeting on 5 May 2016, which was announced in the online Spartanburg Herald-Journal and via mailed meeting announcements. Oral and written comments were solicited at the meeting and accepted during a public comment period from 24 March 2016 through 6 June 2016. No written comments from the public were received. The SC DHEC reviewed the PP and provided comments. These comments and response to comments are provided in Part 3: The Responsiveness Summary.

2.5.4 Subsequent to the PP comment period, and in addressing state comments (provided in Part 3 of this DD), modifications were coordinated with the state to blend alternatives for AGC (Alternative 4) and Analog technologies (in Alternative 3) to optimize the remedy. Although AGC was originally presented as a stand-alone alternative, it may not achieve UU/UE everywhere, as commented by the state. However, AGC sensors provide more detailed, higher quality digital mapping data to support confidence in adequate removal to meet the remedial action objective (RAO). Therefore, AGC is the preferred geophysical technology where it can be used. Based on this technology preference and in response to the state comments, USACE coordinated modification of Alternative 3 to incorporate AGC as a primary and preferred technology used in the selected remedy, while still supported by analog and LUCs.

2.6 SCOPE AND ROLE OF RESPONSE ACTION

2.6.1 The Camp Croft FUDS is comprised of 10 MMRP Projects created out of the original FUDS Project I04SC001603. This DD addresses MRS 10. The remaining MRSs are addressed in separate DDs.

2.6.2 The selected remedy for MRS 10 is protective of human health and the environment by eliminating, reducing, or controlling the potential for encounters with munitions at the site by removing munitions from the surface and subsurface of MRS 10 and implementing appropriate land use controls. Based on the results of sampling, risk assessments concluded the potential for adverse risks to human health or ecological receptors from exposure to MC in soil and sediment is considered negligible. As such, no action is necessary for MC. USACE will implement the selected remedy under the Defense Environmental Restoration Program.

2.7 PROJECT CHARACTERISTICS

2.7.1 Site Characteristics

2.7.1.1 Site risks were evaluated in terms of a Conceptual Site Model that consists of a source of the munitions present, receptors, and potential interaction at the exposure point or exposure pathways. Within this model, the source consists of munitions in the environment. Receptors include residents, agricultural and construction workers, recreational users and visitors. Based on the findings of the RI, the exposure pathway is complete. Figure 2-1 illustrates these areas with respect to past military use.

2.7.1.2 The Camp Croft FUDS is located in northwest SC, less than 10 miles southeast of downtown Spartanburg, SC. The site is roughly bound to the north by SC Highway 295, to the east by U.S. Highway 176, to the south by SC Highway 150 and to the west by SC Highway 56. The site can be accessed by taking U.S. Highway 176 south at Exit 72 along U.S. Interstate 85. Spartanburg County is located in the northwestern part of the state, in what has come to be known as the "Piedmont Crescent." The county lies just southeast of the Blue Ridge Mountains in the piedmont plateau, which is characterized by subdued topographic features and moderate relief. The land surface is inclined to elevations exceeding 1,000 feet in the northwest section of the county to less than 600 feet in the southeast. Hills have a well-rounded appearance with no conspicuously prominent ridges or peaks. Valley floors are generally about 100 feet deep with well-developed water courses. There are few swamp-like areas.

2.7.1.3 MRS 10 contains a small portion of Croft State Park, forest, open fields, and residential properties. There are two small bodies of water on a residential property, Grain Pond and C P Pressley Pond. Several creeks flow through the MRS. The Spartanburg Gun Club owns property adjacent to and north of MRS 10. Red Hill landfill is located in the eastern portion of the MRS. The eastern side of the property is crossed by US 176, while further to the northeast, the town of Pacolet is located. The southwest portion of the property is bisected by Whitestone Road.

2.7.1.4 Although there are currently no known nests located within the boundary of MRS 10, bald eagles are known to nest in Croft State Natural Area and are protected by the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. Both laws prohibit killing, selling or otherwise harming eagles, their nests, or eggs.

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FIGURE 2-1 FUDS PROJECT LOCATIONS

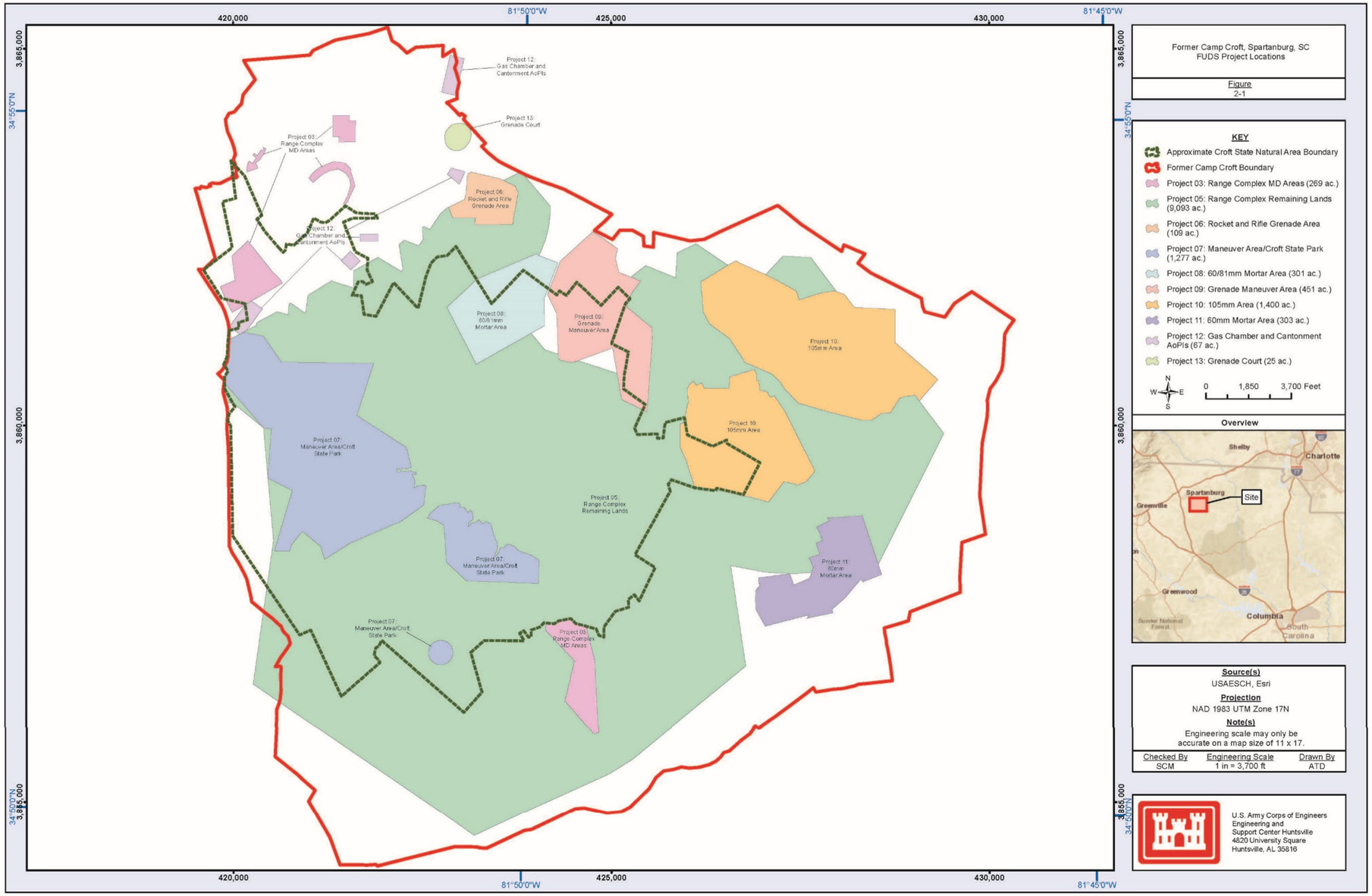
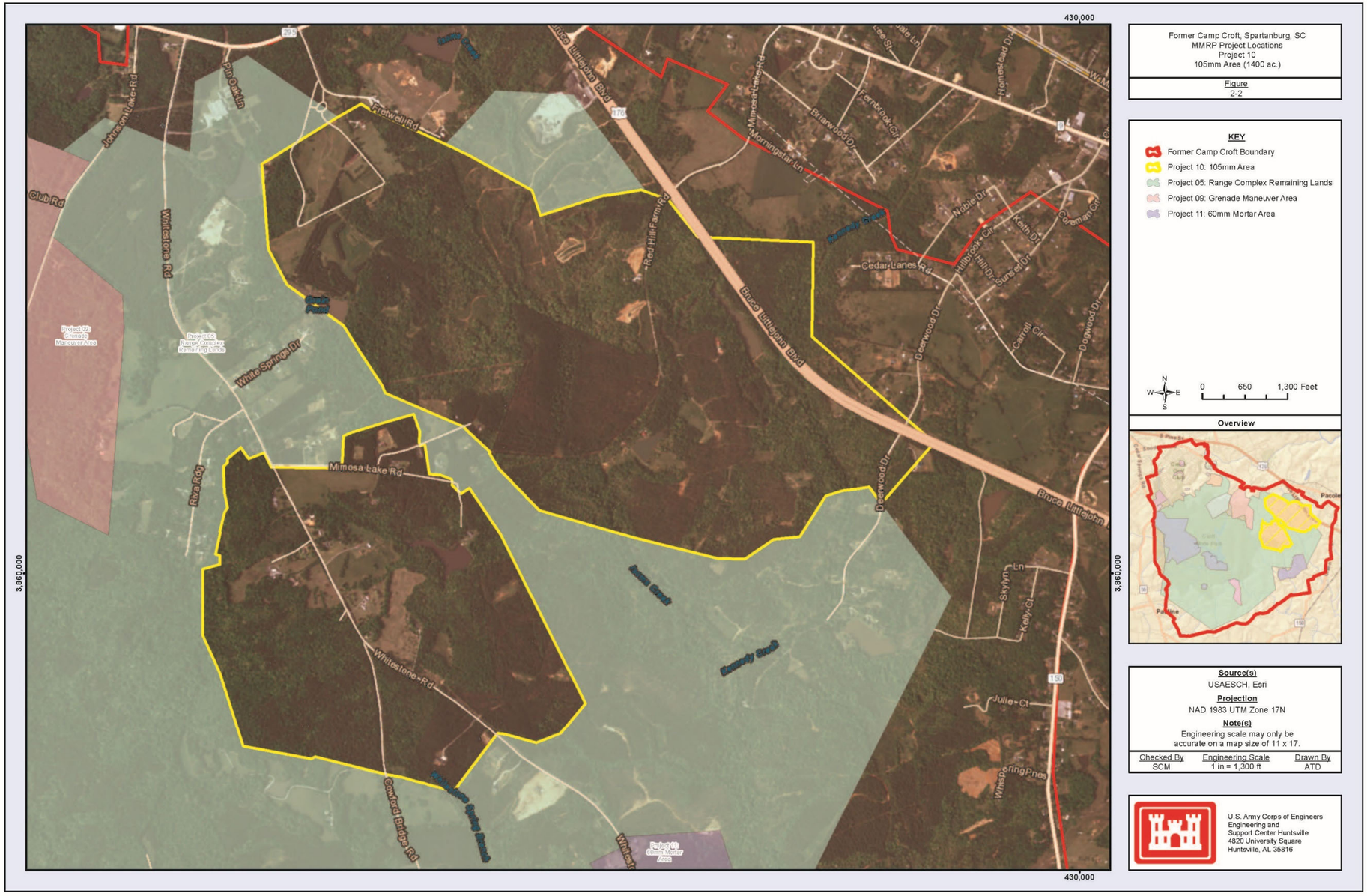


Figure 2-2 FUDS PROJECT I04SC001610 LOCATION



2.7.2 Sampling Strategy

2.7.2.1 For the RI, transects were positioned generally in an east-west orientation. Transect spacing varied between areas based on the fragmentation distance from a detonation of the smallest munition known to have been used in each area. These transects were investigated using mag-and-dig or analog instrument-assisted surface reconnaissance. After reviewing the data collected during the mag-and-dig transect coverage, 110 individual 2,500 square foot grids were positioned principally in areas of medium and high estimated anomaly distribution to better define the nature and extent (bound the area) in which munitions may be present. Targets-of-interest (TOI) were intrusively investigated.

2.7.2.2 MC sampling was also conducted to support the RI; soil samples were collected from grids with high anomaly densities. Surface soil samples were collected from the four grid quadrants (northeast, northwest, southwest, and southeast) and the center point of the grid (i.e., five samples per grid). USACE collected 124 discrete surface soil samples and 12 duplicates during the initial round of soil sampling. Samples were analyzed for explosives using Environmental Protection Agency (EPA) method 8330A and antimony, copper, lead, and zinc using EPA method 6020A.

2.7.2.3 X-ray fluorescence (XRF) was used to analyze soil samples in the field for lead in areas where soil lead levels exceed preliminary action levels. XRF samples were collected at 20-foot intervals in every direction from the original sample locations. In addition to the discrete surface soil samples, post-blow-in-place (BIP) composite surface soil samples were collected immediately following the detonation of MEC to determine if MC contamination remained after the detonation. The U.S. Army Cold Regions Research and Engineering Laboratory's 7-Sample Wheel Approach was used to collected composite post-BIP soil samples.

2.7.2.4 In the eastern portion of MRS 10, analog mag and dig transects were conducted across the MRS. In the area formerly known as OOU6, anomaly counts were so high that these were converted to instrument aided surface reconnaissance transects. Four 50-feet (ft) by 50-ft grids were established in the area where elevated concentrations of MD were observed. Those grids were evaluated using an EM-61 and all anomalies were intrusively investigated. Five soil samples were collected from each of four grids. No explosives were detected. Various metals were detected, none above corresponding project action limits. In the western portion of MRS 10, transects were surveyed using mag-and-dig methods and one 10-ft by 250-ft grid was established where elevated concentrations of MD were observed. That grid was evaluated using an EM-61 and all anomalies were intrusively investigated. Numerous MD items were encountered across the area; fragments resembled variously sized projectiles. Small arms were encountered along transects in several locations. Five soil samples were collected from the grid. No explosives were detected. Various metals were detected, with none above corresponding project action limits.

2.7.3 Location of Munitions and Potential Routes of Migration

2.7.3.1 The 12 operational ranges at Camp Croft were used for live-fire training. Live-fire training was conducted with small arms ammunition (i.e., ammunition, without projectiles that contain explosives (other than tracers), that is .50 caliber or smaller, or for shotguns), anti-tank rockets, anti-aircraft artillery, 60 mm infantry mortars, and 81 mm infantry mortars. The training range impact areas that comprised 16,929 acres are classified as the former range impact areas; a 167-acre cantonment area and

a 175-acre grenade court were also located at the camp.

2.7.3.2 A wide range of MEC has been removed from MRS 10 area that includes numerous 105mm projectiles and 81 mm and 61 mm mortars. Thousands of pounds of MD have reportedly been removed from various areas across the site. Despite these previous activities, this area was observed to have some of the highest concentrations of MD following the RI field activities. The maximum depth of MEC recovered was 2 feet below ground surface (bgs). No explosives were detected, and no metals detections exceeded the project action limits.

2.7.3.3 Munitions may remain present for long periods of time. Several factors influence the possible migration of munitions from a site. These may include erosion and inappropriate and unsafe human activity, in which people pick up and move munitions.

2.7.3.4 Human populations that could be affected include recreational users, residents, and visitors.

2.8 CURRENT AND POTENTIAL FUTURE SITE AND RESOURCE USES

2.8.1 Land Uses

2.8.1.1 Spartanburg County generally is divided into four broad categories including (a) agricultural or cropland; (b) development (urban); (c) mixed forest (woodland); and (d) deciduous forest (woodland). The developed areas are continually expanding, running into agricultural, grassland, and forested areas in response to changes brought by growth and development.

2.8.1.2 Croft State Natural Area occupies approximately 7,054 acres of the 19,044-acre Camp Croft FUDS property. Part of the western portion of MRS 10 lies within the part of Croft State Park. This portion of the park includes Whitestone Springs and a horseback riding and hiking trail. The remainder of MRS 10 extends north and east from the park and is all privately owned. Many residences are located on this portion of the MRS with the remainder being mostly forest. Given the proximity to the town of Pacolet and development in the five years since the RI was conducted, it is likely that further residential development will continue in the future.

2.8.2 Groundwater Uses

Groundwater in this area is not expected to be part of a complete exposure pathway to receptors at MRS 10; no potable groundwater wells were identified within MRS 10.

2.9 PROJECT SITE RISKS

2.9.1 Human Health & Ecological Risks

During the RI, risk assessments were conducted to determine the human health and ecological risks associated with potential MC exposure at the former Camp Croft. Based on the analytical results of MC sampling, the risk assessments concluded that the potential for adverse risks to human health or ecological receptors from exposure to MC is negligible. Therefore, MC was determined not to pose an unacceptable risk to human health and the environment. As such, no further action will be taken to address MC.

2.9.2 MEC Hazard Assessment

2.9.2.1 USACE completed a qualitative MEC Hazard Assessment (HA) using information from previous investigations and the RI to provide a baseline assessment of response alternatives.

2.9.2.2 Considering the current site conditions, the MEC HA results indicate the potential for explosive hazard conditions to be considered "high" for current and reasonably anticipated future land uses at MRS 10. Results of the HA are discussed in detail within the RI and FS Reports, which are available on the project website and in the Administrative Record file.

2.9.2.3 The location of munitions determined to be MEC, areas with higher relative MD density, and future land-use activities were also used to assess response alternatives and develop a basis for the selected remedy. In areas with a higher relative MD density, a receptor (human) may have a greater chance of encountering a munition based on anticipated future land use activities in these areas.

2.9.3 Basis for Response Action

2.9.3.1 The selected remedy for MRS 10 is implementation of AGC & Analog Supported Surface and Subsurface Munitions Removal and Implementation of a 3Rs Program. MEC has been confirmed to be present (either during the RI or historically) within this area.

2.9.3.2 The selected remedy this DD presents is necessary to protect human health and welfare from the potential to encounter munitions that may be MEC on the surface or in the subsurface. The completion of a munitions response action will reduce the potential for people to encounter a munition.

2.10 REMEDIAL ACTION OBJECTIVES

The RAO is to reduce the unacceptable risk due to the presence of MEC within MRS 10, to a depth of three feet bgs, to address the possibility of exposure to residential users such that an acceptable condition of negligible risk can be achieved. The modified alternative 3 will meet the RAO by removal of identified MEC hazards in all accessible areas to a depth of 3 feet, preventing potential for exposure. The detection technology used will demonstrate that the detection depth of intact munitions is greater than or equal to, the lesser of the expected depth of the munition or the RAO depth.

TABLE 2-2 REMEDIAL ACTION OBJECTIVES

Area	MEC Depth (bgs)	Land Use Depth (bgs)	RAO Depth (bgs)
MRS 10: 105mm Area	2 ft	Resident/2 ft	3 ft

2.11 DESCRIPTION OF ALTERNATIVES

2.11.1 The FS developed and evaluated four remedial alternatives for MRS 10:

- Alternative 1 – No Action;
- Alternative 2 – Land Use Controls (e.g., signage) and Implementation of a 3Rs Program;
- Alternative 3 – AGC and Analog Supported Surface and Subsurface Munitions Removal and LUCS including Implementation of a 3Rs Program; and,

- Alternative 4 – Digital Advanced Classification Supported Surface and Subsurface Munitions Removal to Support UU/UE.

2.11.2 Remedy Components

2.11.2.1 Alternative 1 - No Action is carried forward to represent the existing condition at the site. Under CERCLA, the No Action alternative is required for use as a baseline measure against the other alternatives. No Action assumes the following:

- No treatment technology;
- No containment technology;
- No institutional controls; and
- No monitoring requirements.

2.11.2.2 Alternative 2 – Implementation of Land Use Controls, including a 3Rs Program, assumes that a removal action would not occur. Implementation of a 3Rs Program would include:

- Funding and implementation by USACE;
- Informing the public of the actions to take should they encounter or suspect they have encountered a munition;
- Posting of warning signs; and
- Developing, if needed, and distributing 3Rs Program materials.

2.11.2.3 Alternative 3 – AGC & Analog Supported Surface and Subsurface Munitions Removal and LUCS including Implementation of a 3Rs Program. Alternative 3 includes:

- Funding and implementation by USACE;
- Informing the public of the actions to take should they encounter or suspect they have encountered a munition;
- Posting of awareness signs;
- Developing, if needed, and distributing 3Rs Program informational material;
- Removing munitions visible on the ground surface; and
- Investigating selected subsurface anomalies identified by digital/analog sensors to 3 ft. and removing to that depth based upon those investigations.
- Preferential use of AGC where technically feasible, excluding footprints of large trees, building, and permanent structures, concrete and asphalt pads and roads, water features greater than 1-foot depth, and terrain and slopes deemed a safety risk. *
- *This aspect of Alternative 3 was not a part of Alternative 3 in the PP, but it was included in the PP within Alternative 4 and incorporated to optimize success of this alternate. The use of Digital Advanced Classification is a change that USACE made after the PP was published and based on additional consideration coordinated with SC DHEC. This is discussed in Section 2.16.

2.11.2.4 Alternative 4 - Digital Advanced Classification Supported Surface and Subsurface Munitions Removal to Support UU/UE. Alternative 4 would include:

- Funding and implementation by USACE;
- Removing munitions visible on the ground surface; and
- Using advanced digital geophysical mapping and advanced geophysical classification to

identify subsurface anomalies that may be a munition, investigating anomalies that are most likely a munition or that cannot be differentiated from non-munitions anomalies, and removal of munitions encountered.

- All targets of interest identified with advanced geophysical classification will be investigated.
- Sifting technology to remove the top 3 feet of soil to increase effectiveness of advanced geophysical classification.

2.11.3 Common Elements and Distinguishing Features of Each Alternative

2.11.3.1 Applicable or Relevant and Appropriate Requirements (ARARs)

Applicable requirements are "those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility siting laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance found at a CERCLA site" as defined in 40 C.F.R. § 300.5. ARARs applicable to implementation of Alternative 3 are listed in Table 2-3. Extensive brush clearing that is required for this remedy has the potential to impact nesting eagles. The remediation work will be scheduled so that bald eagles are not subject to "take" (defined as including being disturbed or molested) during nesting season.

TABLE 2-3 APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARS)

Regulatory Authority	Law/Regulation	Requirement	Comment
Federal	*Migratory Bird Treaty Act (16 U.S.C. § 703),* and *Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d)*	Governs activities that may adversely affect migratory birds. Destruction of active bird nests, eggs, or nestlings that can result from spring and summer vegetation clearing is a violation of the Act.	Bald eagles have been known to nest in the former Camp Croft.
Federal	*40 C.F.R. § 264.601*	Requires miscellaneous units for the management of hazardous waste, such as open burning/open detonation units, to be located, designed, constructed, operated, maintained, and closed in a manner that will ensure protection of human health and the environment.	Prevent any releases that may have adverse effects on human health or the environment due to migration of waste constituents in ground water, subsurface soil, surface water, wetlands, surface soil and/or air. Specifically referenced for consolidation of MEC.

2.11.4 Long-term Reliability

2.11.4.1 Alternative 1 – No Action provides no reduction in munitions present; therefore, offers no permanent remedy.

2.11.4.2 Alternative 2 – Implementation of LUCs only, to include a 3Rs Program does not reduce the volume

of munitions present, however, it reduces the potential for people to interact with munitions (e.g., disturb, touch or move) that are encountered. As such, implementation of a 3Rs Program is intended to inform the public of actions to take should they encounter a munition, reducing the potential for people who encounter or suspect they have encountered a munition to interact with it.

2.11.4.3 Alternative 3 – AGC and Analog Supported Surface and Subsurface Munitions Removal and LUCs including Implementation of a 3Rs Program permanently reduces the risk of an encounter with surface and subsurface munitions and serves to reduce the potential for people who encounter or suspect they have encountered a munitions to interact with it.

2.11.4.4 Alternative 4 – Digital Advanced Classification Supported Surface and Subsurface Munitions Removal to Support UU/UE would provide permanent reduction of hazard for recreational visitors by locating and removing munitions in areas where current and future land use dictates and remove munitions.

2.11.5 Estimated Time to Implement

2.11.5.1Alternative 1 – No Action can be implemented immediately.

2.11.5.2 Alternative 2 – Land Use Controls, including a 3Rs Program, can be implemented within three to six months. Distribution of 3Rs Program education material would be ongoing.

2.11.5.3 Alternative 3 – A conservative estimate for an AGC and Analog Supported Surface and Subsurface Munitions Removal and LUCs including Implementation of a 3Rs Program, to be completed in three years. The time frame to complete the remedial design, fieldwork and reporting is dependent on the design and review schedule, site conditions at the time of field work execution, and other applicable factors. However, the LUCs portion of this alternative can be implemented within six months.

2.11.5.4 Alternative 4 – A Digital Advanced Classification Supported Surface and Subsurface Munitions Removal to Support UU/UE can be implemented within four to six months. The time frame to complete the remedial design, fieldwork and reporting is dependent on design and review schedule, site conditions at the time of field work execution, and other applicable factors. A conservative estimated time-to-complete would be three years.

2.11.6 Cost

Estimated present worth costs for each alternative are shown in Table 2-4.

TABLE 2-4 ALTERNATIVE APPROXIMATE COST SUMMARY

Alternative	Present Worth* ($)
1. No Action	$0
2. LUCS including Implementation of 3Rs Program	$1,038,012
3. AGC and Analog Supported Surface and Subsurface Munitions Removal and LUCs including Implementation of 3Rs Program	$61,930,701
4. Digital Advanced Classification Supported Surface and Subsurface Munitions Removal to Support UU/UE	$116,687,700

* In accordance with EPA guidance for the purpose of the detailed analysis of alternatives, the period of performance used for costing purposes was 30 years. The cost of Five-Year Reviews is not included until the remedy is implemented and a more refined cost estimate can be determined

2.11.7 Expected Outcomes of Each Alternative

Alternative 1 affords no protection to human health and is not effective in reducing the potential for an encounter with munitions at MRS 10. Alternative 2 does not reduce the volume of munitions present; however, it reduces the potential for people to interact with munitions (e.g., disturb, touch or move) through the implementation of Land Use Controls, thereby reducing the potential for an encounter with a munition that could result in serious injury or death. Alternative 3 reduces the risk of an encounter with surface or subsurface munitions by removing surface and subsurface munitions. If munitions are encountered, the implementation of Land Use Controls, including a 3Rs Program, reduces the potential for the public to interact with a munition. Alternative 4 would provide permanent reduction of hazard for recreational visitors performing surface and intrusive activities.

2.12 COMPARATIVE ANALYSIS OF ALTERNATIVES

Table 2-5 provides an assessment of each remedial alternative with respect to the nine NCP criteria.

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TABLE 2-5 ASSESSMENT OF REMEDIAL ALTERNATIVES

Remedial Alternative	NCP Evaluation Criteria								
	Threshold Criteria		Balancing Criteria					Modifying Criteria	
	Overall Protectiveness of Human Health and the Environment	Compliance with ARARs	Short-Term Effectiveness	Long-Term Effectiveness & Permanence	Reduction of Toxicity, Mobility, and Volume Through Treatment	Implementability	Cost	State Acceptance	Community Acceptance
Alternative 1 **No Action** No action would be taken to reduce potential MEC hazards to a potential receptor.	No action would be taken to reduce potential MEC hazards to a potential receptor. This alternative is not protective of human health and the environment.	N/A	No action would be taken to reduce potential MEC hazards to a potential receptor. Accordingly, alternative would be implemented immediately, there would be no risks resulting from implementation, but risks to receptors would remain the same.	No action would be taken to reduce potential MEC hazards to a potential receptor.	No action would be taken to reduce mobility or volume of MEC.	Not administratively feasible, otherwise easy to implement.	No cost associated with this alternative.	The State did not comment on the acceptability of this Alternative.	No comments from the public were received.
Alternative 2 **Land Use Controls, including Public Education** Includes distribution of informational material and posting of MEC awareness signs.	Public Education will reduce the hazard to human receptors through education resulting from distribution of informational documents and posting of signs. Does not provide overall protectiveness.	N/A	Individuals familiar with formerly used military sites, munitions types, and safety would be involved with the development and distribution of informational documents. Protection will occur immediately following implementation and can be executed within three to six months. Distribution of materials will be ongoing.	Since MEC is not removed, the long-term effectiveness/ permanence is questionable. Distribution of community MEC awareness informational documents would need to occur continually to ensure availability to receptors.	No reduction in volume as no MEC clearance would take place.	Distribution of informational documents and posting of signs are technically feasible. Materials and personnel are readily available for implementation. Property rights-of-entry would only be required for posting of signs. Implementation can occur within three to six months. Distribution of materials should be ongoing.	$794,821 $1,038,012 (includes LTM)	The State provided comment on this Alternative.	No comments from the public were received.
Alternative 3 **AGC & Analog Surface and Subsurface MEC Removal and Land Use Controls*** Clearance of surface MEC and subsurface anomalies Land Use Controls, including Public Education, and Long-term Monitoring. *With Digital Advanced Classification used to the extent it is technically feasible.	This alternative is protective of human health and the environment by eliminating, reducing, or controlling hazards at the site through treatment (i.e., clearance) and Land Use Controls, including Public Education.	YES	The clearance of surface MEC and subsurface anomalies is effective in mitigating hazards. Land Use Controls are effective in reducing potential hazards due to any remaining MEC.	This alternative is effective as a long-term remedy.	Surface MEC and subsurface anomalies would be removed, resulting in the reduction of mobility and volume.	Surface and subsurface clearance of MEC is technically feasible for an entire area or a smaller footprint within an area, based on accessibility and land use. Moderate technical effort required for implementation. UXO-qualified personnel would visually inspect, aided by hand-held instruments, the ground surface and use hand-held sensors to detect and remove items under dense vegetation as well as subsurface anomalies. Use of Digital Advanced Geophysical Classification where technically feasible. Suspected MEC items would be inspected for explosive hazards and disposed of accordingly.	$61,930,701 $62,173,887 (includes LTM)	On 28 August 2019, the State concurred with the acceptability of this Alternative, as modified in this DD.	No comments from the public were received.
Alternative 4 **Digital Advanced Classification Surface and Subsurface MEC Removal to Achieve UU/UE** This alternative includes clearance of surface MEC and MEC from below the surface using a combination of Digital Advanced Classification, to a depth compatible with land use or actual known depths of the ordnance (determined to be 2 feet due to land use and an additional 1 foot to achieve the Remedial Action Objectives).	This alternative is protective of human health and the environment by eliminating, reducing, or controlling hazards at the site through treatment (i.e. clearance). Sifting will cause substantial damage to the environment and Bald Eagle habitat.	NO, based upon potential Bald Eagle impacts	The clearance of surface and subsurface MEC is effective. Potential significant exposure to UXO workers during implementation. Hazard to the public resulting from implementation is considered minimal; however, there will be adverse impact on recreational users for several decades.	This alternative is effective as a long-term remedy.	Greatest reduction of MEC volume. Surface and subsurface MEC would be removed using the most effective technology available, resulting in the reduction of mobility and volume.	Surface and subsurface clearance of MEC by a combination of Digital Advanced Classification and sifting is technically feasible but extremely difficult based on vegetation, terrain, structures (e.g., buildings, slabs) and infrastructure (e.g., roads, parking lots, utilities). Furthermore, the inclusion of sifting to achieve UU/UE would significantly increase environmental effects and disrupt recreation use and traffic more than other alternatives.	$116,687,700	The State provided comment on the acceptability of this Alternative, offering opinion that it may not achieve UU/UE everywhere.	No comments from the public were received.

2.13 PRINCIPAL MEC/MC ISSUES

The principal concern at MRS 10 is munitions that may pose an explosive hazard (i.e., MEC). The selected remedy will be protective by removing MEC from the surface and subsurface. It does so by using geophysical instruments to detect subsurface anomalies, classify them if possible, and intrusively investigate those anomalies that may be munitions or that cannot be discriminated from non-munitions, and removing and destroying munitions that are determined to be MEC. AGC will be used to support the subsurface removal where technically feasible and analog instrumentation will be used to supplement the effort where physical constraints preclude the use of AGC instruments. For any remaining munitions hazards, Land Use Controls will be implemented.

2.14 SELECTED REMEDY

The selected remedy for MRS 10 is AGC and Analog Supported Surface and Subsurface Munitions Removal and LUCS including Implementation of a 3Rs Program. Subsequent to the Proposed Plan comment period, and in addressing state comments (see Part 3: The Responsiveness Summary), modifications were made to blend Alternatives 3 and 4 to optimize the remedy. Although AGC was originally presented as a stand-alone alternative, it may not achieve UU/UE everywhere, as commented by the state. However, AGC will provide higher quality, auditable data to support confidence in adequate removal to meet the RAO. AGC is the preferred geophysical technology, where it can be used. It is therefore being incorporated as a primary component of Alternative 3, the selected remedy, still supported by analog where needed and LUCs.

2.14.1 Summary of the Rationale for the Selected Remedy

2.14.1.1 The selected remedy, which implements a surface and subsurface MEC clearance, Land Use Controls, and Long-Term Management (LTM), is appropriate for FUDS Project I04SC001610. The selected remedy will reduce potential hazard associated with MEC exposure through reduction in MEC volume. The selected remedy will comply with the ARARs listed in Table 2-3 by avoiding Bald Eagle impacts. Alternative 3 was selected over the other three alternatives in accordance with NCP evaluation criteria. This alternative is protective of human health and the environment by eliminating, reducing, or controlling the potential for munitions to be encountered within MRS 10 by treatment (e.g., removal destruction) and LUCs (e.g., 3Rs Program). The removal of surface and subsurface munitions is effective with minimal hazards to the public resulting from implementation.

2.14.1.2 This alternative is effective as a long-term remedy and will produce the most cost-effective reduction in the volume of munitions present. Surface and subsurface munitions would be removed using the best and most appropriate technology available.

2.14.1.3 USACE believes that the remedy meeting the RAO is protective of human health and the environment and satisfies the statutory requirements of CERCLA.

2.14.2 Detailed Description of the Selected Remedy

2.14.2.1 The selected remedy includes the removal of munitions from the surface and the subsurface and implementation of LUCs, including Implementation of a 3Rs Program. The selected remedy is considered appropriate in areas where munitions were encountered on the surface and in the subsurface.

2.14.2.2 A surface munitions removal would be conducted, followed by digital geophysical mapping. Advanced classification of the digital geophysical data would identify targets-of-interest for intrusive investigation. Such subsurface targets-of-interest shall be removed, including anomalies that are most likely munitions and anomalies that cannot be discriminated from non-munitions. Where AGC is not possible, analog geophysical instruments will be used to identify subsurface anomalies which will then be intrusively investigated to a depth of 3 feet. Munitions recovered, including MEC, will be removed and treated safely in a manner consistent with applicable laws and regulations.

2.14.2.3 Extensive brush clearance would likely be required in many areas prior to conduct of the response action. Selected anomalies would be investigated with anomaly sources removed. Munitions determined to be MEC will be destroyed by detonation either in place or at designated, approved locations.

2.14.2.4 USACE expects this alternative will still have some residual risk due to trees, terrain, structures and infrastructure at the site which will not allow for UU/UE. USACE will implement Land Use Controls (including a 3Rs Program) as described in Alternative 2 to address the residual risk.

2.14.3 Cost Estimate for Selected Remedy

The total cost of the selected remedy, Alternative 3, as modified after the Proposed Plan, is estimated to be $61,930,701. These estimates are for capital costs associated with preparation of plans, field work, reporting and implementation of LUCs. Five-year reviews are not included in this cost. The estimated costs presented are order-of-magnitude engineering cost estimates that are expected to be within +50 to -30% of the project's actual cost.

2.14.4 Expected Outcomes of the Selected Remedy

The expected result of implementing this remedy is to reduce potential explosive hazards to a level allowing continued anticipated land use for the site as residences and a state park. Extensive brush clearance will be required in many areas prior to the response action. Each target-of-interest (e.g., anomaly) would be investigated, with encountered munitions removed. If MEC is encountered, it will be disposed of safely using approved procedures. The completion of munitions removal would reduce both the potential for MEC to remain present and for the public to encounter a munition. Also, the 3Rs program material reduces the potential for the public to interact with any remaining munitions that may be encountered. The selected remedy will not impact current or anticipated future land uses.

2.15 STATUTORY DETERMINATIONS

In accordance with statutory requirements of CERCLA, the remedial action will be protective of human health, comply with ARARs, be cost effective, utilize permanent solutions and alternative treatment technologies to the maximum extent practicable, and include treatment as a principal element.

2.15.1 Protection of Human Health and the Environment

2.15.1.1 This remedy is protective of human health and the environment by eliminating, reducing, or controlling potential explosive hazards at MRS 10 through the removal of munitions and destruction of munitions that may be determined to be MEC. The actual known maximum depth of munitions and MD is less than two feet bgs. Based on the current or reasonably anticipated land use, munitions will be removed from the surface and subsurface to a depth of three feet bgs (see Table 2-2).

2.15.1.2 Source reduction (i.e., the removal of munitions) will be used to reduce the potential for an encounter with a munition to result in serious injury or death. The implementation of the selected remedy will not pose an unacceptable short-term risk to human health or the environment or result in cross-media impacts.

2.15.2 Compliance with Applicable or Relevant and Appropriate Requirements

The selected remedy will comply with ARARs.

2.15.3 Cost Effectiveness

The selected remedy is cost effective because it provides the most comprehensive means of reducing the potential encounter of a munition within MRS 10 at a reasonable cost compared to the other alternatives and with fewer environmental impacts than Alternative 4.

2.15.4 Permanent Solution and Alternate Technology

The selected remedy is extremely effective as a long- term remedy because munitions that are encountered are removed from MRS 10 permanently reducing the hazard level.

2.15.5 Preference for Treatment as a Principal Element

The selected remedy includes removal and destruction of MEC, which is considered treatment as a principal component. A surface and subsurface removal will be used to remove MEC. As such, this removal action achieves the greatest reduction in the volume of munitions present. Surface and subsurface munitions would be removed using the most effective technology available, resulting in the reduction of mobility and volume. Implementation of the selected remedy reduces the potential for users to encounter munitions.

2.15.6 Five-Year Reviews

Five-Year Reviews are required to ensure the remedy remains protective of human health & the environment. As required in 40 C.F.R. § 300.430(f)(4)(ii), remedial actions that do not allow for UU/UE must be reviewed no less than every five years after initiation of the selected remedial action. The reviews will be conducted to ensure the selected remedy remains protective of human health, safety, and the environment. The selected remedy does not allow for UU/UE; therefore, Five-Year Reviews will be conducted.

2.16 DOCUMENTATION OF SIGNIFICANT CHANGES

2.16.1 The PP for the former Camp Croft was released for public comment on 24 March 2016. The PP identified Alternative 4 - Digital Advanced Classification Supported Surface and Subsurface Munitions Removal to Support UU/UE as the preferred alternative for FUDS Project I04SC001610: 105mm Area (MRS 10).

2.16.2 Recognizing that the MRS 10 area contains structures and other impediments to complete coverage of geophysical data collection and/or intrusive investigation and in response to SC DHEC concerns, USACE modified the Alternative 3 – AGC and Analog supported Surface and Subsurface Munitions Removal and LUCs including Implementation of a 3R's Program. Digital Advanced Classification has limitations therefore the technology will be utilized where technically feasible and supported by Analog technologies. Statutory Five-Year Reviews will be conducted.

2.16.3 The cost estimate for Alternative 3 in the 2015 FS was $11,549,498. In the intervening years between the FS and this DD, the actual costs for removals using advanced geophysical classification have increased significantly, resulting in a higher cost estimate compared to the original estimate for MRS 10. Therefore, USACE used recent actual cost data to update the cost estimate for this alternative, as it was modified, and the estimated cost to implement Alternative 3 is $61,930,701. The greater cost for Alternative 4 is due to the most accurate costing of Advanced Geophysical Classification plus the additional cost to reach UU/UE by removal of all impediments, to include trees, structures, roads, parking lots and shrubs.

2.16.4 The revision and selection of Alternative 3 concludes a process of refining information evaluated in the Proposed Plan. Specifically, the use of Digital Advanced Classification was assessed in the PP, and the remedial technologies proposed in the PP are essentially the same as those in this DD. The PP described and evaluated the components of this DD's selected remedy, including Alternative 3 as well as the use of Digital Advanced Classification within the PP's Alternative 4. In addition, information in the PP indicated there are impediments to the use of Digital Advanced Classification (e.g., structures that would have to be removed), which SC DHEC highlighted in a comment and which informed the selection of Alternative 3 as modified in this DD.

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3.0 PART 3: THE RESPONSIVENESS SUMMARY

The public comment period for the Proposed Plan was from 24 March 2016 to 06 June 2016. USACE facilitated a public meeting at the Spartanburg Marriott Renaissance Hotel on 24 March 2016. The Proposed Plan was also presented to the RAB and the public on 05 May 2016.

3.1 STAKEHOLDER ISSUES AND LEAD AGENCY RESPONSES

No comments were received from the public on the Proposed Plan. The SC DHEC reviewed the Proposed Plan and provided the following comments on the acceptability of the selected remedy. Responses are included below each comment.

SC DHEC Comment: As stated in comments to the FS, the Department is hesitant to support any alternative with the goal of unrestrictive use/unrestrictive exposure as we believe some type of land use controls (LUCs) will be necessary. Our opinion of necessary LUCs may vary for different areas of the former Camp Croft based on the former land use, coverage of the investigations, work complete, and accessibility of area for investigation based on right-of-entry.

Response: USACE concurs with SC DHEC that UU/UE is not obtainable because of the potential for MEC to remain due to trees, terrain, structures and infrastructure. Therefore, Alternative 3 – AGC & Analog supported Surface and Subsurface MEC Removal and Land Use Controls, including a 3Rs Program, will be used but updated to include the use of Digital Advanced Classification where technically feasible.

SC DHEC Comment: The RAOs listed in Table 2 [*of the Final Proposed Plan*] show a maximum depth of potential intrusive depth based on the prior land use and associated MEC. The Department is curious if the USACE will investigate any anomalies that are retained during the advanced geophysical classification (Alt.4) if they are detected below the RAO depth, if the instrumentation is capable of gathering reliable data past this depth. At other sites within SC, the remediation efforts involving MEC have been 'to depth,' a term used to define the limits of the instrumentation, not the RAO.

Response: Yes, for Alternative 4, which includes the goal of attaining UU/UE, anomalies retained during advanced classification that are below the RAO specified depth will be intrusively investigated. SC DHEC will have the opportunity to comment on the Remedial Design. Advanced geophysical classification (AGC) has not been used on prior remediation projects in SC. Traditional geophysical sensors can identify an anomaly but do not collect sufficient information to determine if the source is a munition. Therefore, it was necessary to clear to depth of detection to ensure all targets of interest (TOI) were investigated. The RAO depth for MRS 10 is set to account for depths of munitions encountered during the RI. All TOI should be identified within this depth. However, if potential TOI are identified deeper, it will be necessary to intrusively investigate the source.

SC DHEC Comment: From the February RAB meeting, it was mentioned by John Moon, the Croft State Park Ranger, that there are nesting Bald Eagles within Croft State Park.
The Department understands that this was new information but wants to ensure that this information

has been followed up by the USACE to determine if appropriate ARAR(s) are necessary.

Response: Section 2.7.1.4 addresses nesting bald eagles; Table 2-3 identifies ARARs, including the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. While there may be nesting bald eagles within the park, there are no nesting bald eagles within MRS 10.

SC DHEC reviewed this DD and provided its concurrence with the selected remedy via letter dated 22 May 2020.

3.2 TECHNICAL AND LEGAL ISSUES

No technical or legal issues have been identified.