

FINAL
DECISION DOCUMENT
FORMER CAMP CROFT
MANEUVER AREA/CROFT STATE PARK
SPARTANBURG, SOUTH CAROLINA FUDS
PROJECT NUMBER I04SC001607



Prepared by:

U.S. Army Corps of Engineers

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EXECUTIVE SUMMARY

ES.1 This Decision Document (DD) presents the selected remedy for the Maneuver Area/Croft State Park, which is located within the Camp Croft Formerly Used Defense Site (FUDS) Property Number I04SC0016. The Maneuver Area/Croft State Park is designated as FUDS Project I04SC001607 (herein referred to as Project 07).

ES.2 Project 07 is comprised of approximately 1,277 acres within Croft State Park (formerly known as the Croft State Natural Area).

ES.3 The Remedial Action Objective (RAO) is to reduce the unacceptable risk due to the presence of munitions and explosives of concern (MEC) within Project 07 to a depth of 2 feet below ground surface to address the possibility of exposure to recreational users such that an acceptable condition of negligible risk is achieved. Department of Defense (DoD) military munitions (munitions), some of which may be determined upon evaluation by qualified personnel (i.e., explosive ordnance disposal (EOD) and unexploded ordnance (UXO)-qualified personnel) to be munitions and explosives of concern (MEC); have been determined to be present within Project 07. The selected remedy is chosen to satisfy the RAO. In developing the RAO, current and future land uses were taken into account.

ES.4 The selected remedy for Project 07 is Analog Supported Surface and Subsurface Munitions Removal and Land Use Controls, including Implementation of a Recognize, Retreat and Report (3Rs) Program, and further items identified in Table 2-5. This remedy includes removal of munitions visible on the ground surface; investigation of selected subsurface anomalies identified by analog sensors to 2 feet as well as the use of Advanced Geophysical Classification, where technically feasible; informing the public of the actions to take should they encounter or suspect they have encountered a munition; posting of awareness signs and development, if needed; and distribution of 3Rs Program informational material;

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 Project 07 is approximately \$43,822,955.

ES.6 Other munitions response actions were considered and evaluated against the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) nine criteria. The alternatives included No Action; Land Use Controls, including Public Education, and Long-Term Management; Analog Supported Surface and Subsurface Munitions Removal and 3Rs Public Education Program; and Advanced Geophysical Classification Supported Surface and Subsurface Munitions Removal to Support Unlimited Use/Unrestricted Exposure (UU/UE). The No Action and 3Rs Explosives Safety Education Program alternatives were considered but concluded not to be protective of human health. The Analog Supported Surface and Subsurface Munitions Removal and 3Rs Explosives Safety Education Program would support current and future anticipated land use. This determination is based on the results of the Remedial Investigation (RI) fieldwork, where there was physical evidence (e.g., munitions debris) of munitions use within Project 07. Advanced Geophysical Classification Supported Surface and Subsurface Munitions Removal

achieved. Munitions constituents (MC) were determined not to pose an unacceptable risk to human health and the environment. As such, no further action is necessary for MC.

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 (USACE) concludes that implementation of the selected remedy over the entirety of Project 07 will result in negligible residual risk allowing for current and future land use; a 3Rs Explosives Safety Education Program (3Rs Program) will be implemented and statutory reviews will begin within five years.

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ABBREVIATIONS AND ACRONYMS

AoPI	Area of Potential Interest
ARAR	Applicable or Relevant and Appropriate Requirements
ASR	Archives Search Report
BD/DR	Building Demolition and Debris Removal
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
DMM	Discarded Military Munitions
DoD	Department of Defense
EE/CA	Engineering Evaluation/Cost Analysis
EPA	United States Environmental Protection Agency
FS	Feasibility Study
FUDS	Formerly Used Defense Sites
HA	Hazard Assessment
IGD	Interim Guidance Document
IRTC	Infantry Replacement Training Center
LTM	Long-term Management
MC	Munitions Constituent
MD	Munitions Debris
MEC	Munitions and Explosives of Concern
mm	millimeter
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
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

The Maneuver Area/Croft State Park is located within the former Camp Croft Formerly Used Defense Site (FUDS), Property Number I04SC0016 and is designated as FUDS Project I04SC001607: Maneuver Area/Croft State Park (herein referred to as Project 07). The Camp Croft FUDS is located approximately 10 miles southeast of Spartanburg, South Carolina 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, and the United States Army Corps of Engineers (USACE) has mission execution authority for the Formerly Used Defense Site (FUDS) Program. The USACE is providing this Decision Document (DD) to describe the Department of Defense's (DoD) selected remedy for the FUDS Project I04SC001607: Maneuver Area/Croft State Park (Project 07), Camp Croft FUDS, Spartanburg, South Carolina.

1.2.2 DoD selected the remedy for Project 07 in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 U.S.C. § 9601 et seq., as amended, and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 C.F.R. Part 300. The South Carolina Department of Health and Environmental Control (SC DHEC) reviewed the Proposed Plan (PP) and provided comments. These comments and USACE's responses are provided in Part 3: The Responsiveness Summary.

The Administrative Record provides supporting documentation for this decision.

1.3 ASSESSMENT OF FUDS PROJECT I04SC001607

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 Project 07. 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 Project 07 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 Project 07 is Analog Supported Surface and Subsurface Munitions Removal and Implementation of a 3Rs (Recognize, Retreat and Report) 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;

- Development, if needed, and distribution of further 3Rs Program informational material;
- Removal of munitions visible on the ground surface; and
- Investigation of selected subsurface anomalies identified by analog/digital sensors to 2 feet, and removals to that depth based upon those investigations.
- Use of Advanced Geophysical Classification where technically feasible.

1.4.2 USACE will implement this remedy.

1.5 STATUTORY DETERMINATIONS

1.5.1 In accordance with CERCLA §121 and 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 Explosive Safety Education 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 Decision Document's Decision 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 Decision Document presents the determination for the CERCLA remedial response action needed for FUDS Project I04SC001607: Maneuver Area/Croft State Park (Project 07). The U.S. Army is the lead agency at the Camp Croft FUDS under the Defense Environmental Restoration Program and USACE has mission execution authority for the FUDS Program. USACE has developed this Decision Document consistent with the Comprehensive Environmental Response, Compensation, and Liability Act, as amended, and the National Oil and Hazardous Substances Pollution Contingency Plan. 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, South Carolina 29306. This document, presenting Analog Supported Surface and Subsurface Munitions Removal and Implementation of a 3Rs Program with a present worth cost of \$43,822,955 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: 23 SEP 19

ANTHONY C. FUNKHOUSER
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 South Carolina, less than 10 miles southeast of downtown Spartanburg, South Carolina. 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 South Carolina Commission of Forestry. This acreage is now known as Croft State Park (formerly known as Croft State Natural Area). USACE has determined that the Croft State Natural Area is eligible for the FUDS program. The MMRP Remedial Investigation (RI) for Camp Croft FUDS was conducted under Project 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 Project 03 into 10 separate projects, including Project 07 Maneuver Area/Croft State Park.

2.1.2 USACE is providing this DD to describe DoD's determination of the selected remedy for Project 07. 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 Project 07 (1,277 acres) is comprised of portions of Croft State Natural Area. Much of the area is wooded, undeveloped land. Park roadways and trails are located throughout the Project 07 site. Campgrounds, support facilities, a horse stable, and parking area are present within the Project 07 MRS. Recreational users (hiking, biking, camping, and horseback riding) have unrestricted access to the area.

2.2 PROJECT HISTORY

Camp Croft Infantry Replacement Training Center (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. The Remedial Investigation Report describes each of these areas.

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 (BD/DR) responsibility at the Camp Croft FUDS. However, USACE recommended additional investigation for munitions, including MC-related contamination, based on interviews revealing that unexploded ordnance 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, 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. Project 07 is part of Training Range Impact Area A.

2.3.3 Phase I Engineering Evaluation/Cost Analysis (EE/CA) and Removal Actions

In 1996, USACE conducted a Phase I Engineering Evaluation/Cost Analysis (EE/CA). Nine Ordnance [Munitions] Operable Units (OOU)s were investigated, including OOU 1A, 1B, and 7 which lie within Project 07. During the EE/CA, nine of 60 millimeter (mm) and two of 81 mm mortar were recovered in OOU1B, and munitions were removed from the surface of the entire area. Munitions were also removed from approximately 3,000 feet of horse trails to a depth of two feet below ground surface (bgs). During the EE/CA, one hundred twenty six 60 mm and seven 81 mm mortars and associated MD were recovered in OOU7, which encompasses a picnic and fitness area. A Time Critical Removal Action (TCRA) was conducted to remove munitions from the surface in 1995. The completed TCRA covered over 50 acres of Croft State Park near the fitness trail and resulted in USACE removing 35 UXO in 1997, USACE completed a subsurface removal of munitions to a depth of two feet, removing 56 UXO.

2.3.4 Phase II EE/CA and Removal Actions

2.3.4.1 USACE conducted a Phase II EE/CA in 1998. This EE/CA investigated five OOU)s. Of these, OOU9A, OOU9B, and OOU10C lie within Project 07. After evaluation, none of the munitions recovered were determined to be MEC. The location are shown in Figure 2-2.

2.3.5 Additional Actions

An ASR Supplement was prepared in 2004 focusing on the 12 operational ranges at Camp Croft FUDS and the munitions used there. Project 07 was included in this ASR supplement.

2.3.6 Remedial Investigation

2.3.6.1 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 (DMM), and approximately 2,900 pounds of MD.

2.6.3.2 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.

2.6.3.3 Based on the RI's findings, MRS 3 - Maneuver Area was delineated as FUDS Project I04SC001607: Maneuver Area/Croft State Park (Project 07). Table 2-1 identifies the revised designation for each of the Pre-RI areas. This DD only addresses Project 07 (highlighted below).

2.6.3.4 *Maneuver Area* – During the RI, 60 mm and 81 mm mortars, 57 mm projectiles, and MKII grenades were recovered, evaluated by qualified personnel, and determined to be MEC. Additionally, MD from 60 mm and 81 mm mortars, 57 mm projectiles, and grenades were recovered.

TABLE 2-1 PROJECT DELINEATIONS

Pre-RI Designation	Revised Designation	Decision Document Delineation (FUDS Project #)
MRS 1	MRS 1	Project 12: Gas Chamber and Cantonment AoPIs
MRS 2	MRS 2	Project 13: Grenade Court
MRS 3 (Land)	105mm Area	Project 10: 105mm Area
	Maneuver Area (1,277 acres)	Project 07: Maneuver Area/Croft State Park
	60mm Mortar Area	Project 11: 60mm Mortar Area
	60/81mm Mortar Area	Project 08: 60/81mm Mortar Area
	Rocket & Rifle Grenade Area	Project 06: Rocket and Rifle Grenade Area
	Rocket/Grenade Maneuver Area	Project 03: Munitions Debris Area
	Remaining Lands	Project 05: Range Complex Remaining Lands
AoPI 3	Grenade Area	Project 03: Munitions Debris Areas
AoPI 5	AoPI 5	Project 12: Gas Chamber and Cantonment AoPIs
AoPI 8	AoPI 8	Project 12: Gas Chamber and Cantonment AoPIs
AoPI 9E	AoPI 9E	Project 12: Gas Chamber and Cantonment AoPIs
AoPI 9G	AoPI 9G	Project 12: Gas Chamber and Cantonment AoPIs
AoPI 10A	Rocket Area	Project 03: Munitions Debris Area
AoPI 10B	Grenade Maneuver Area	Project 09: Grenade Maneuver Area
AoPI 11B		
AoPI 11C	Practice Grenade Area	Project 03: Munitions Debris Area
AoPI 11D	Mortar/Rifle Grenade Area	Project 03: Munitions Debris Area

2.4 ENFORCEMENT ACTIONS

There have been no enforcement actions issued for Project 07.

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 (RI)/Feasibility Study (FS) at the former Camp Croft. A project website, www.campcroft.net, 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 2017, the RAB has met 66 times.

2.5.3 The RI Report, 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, South Carolina as well as on the project website. A public meeting to present the PP was held at the Spartanburg Marriott Renaissance Hotel, Spartanburg, South Carolina 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. Also, SC DHEC reviewed this DD because the selected remedy is one of the alternatives in the PP, with a modification that also was addressed in the PP. The costs for the selected remedy in this DD and the alternative selected in the PP have been re-estimated based on updated cost information. The change in the selected remedy is further discussed in section 2.16.

2.6 SCOPE AND ROLE OF RESPONSE ACTION

2.6.1 The Camp Croft FUDS is comprised of 10 Projects created out of the original FUDS Project I04SC001603. This DD addresses Project 07. The remaining MRSs are addressed in separate DDs.

2.6.2 The selected remedy for Project 07 is protective of human health and the environment by eliminating, reducing, or controlling the potential for encounters with munitions within Project 07 and, specifically, by removing munitions from the surface and subsurface of Project 07 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 recreational users and visitors. Based on the findings of the RI, the exposure pathway is complete. These areas are relatively flat to gently rolling topography. Vegetation type and density varies within Croft State Natural Area. Figure 2-1 illustrates these areas with respect to past military use.

2.7.1.2 The Camp Croft FUDS is located in northwest South Carolina, 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 Croft State Natural Area occupies 7,054 acres of the 19,044-acre FUDS property. Facilities associated with the park include campgrounds (both primitive and for recreational vehicles), horse stables and a show ring, picnic shelters, restrooms, a comfort station, a dump station, a boat ramp, and park office. Lake Tom Moore Craig, a 148-acre impoundment, and Lake Edwin Johnson, a 37.5-acre impoundment, are also located within the park. These lakes total 186 acres and were constructed after the FUDS was transferred to state ownership. Soil from onsite was used to construct the lakes’ earthen dams.

2.7.1.4 Residential areas are concentrated in the north end of the Camp Croft FUDS, and residential property (small and large parcels) exists across much of the former camp, outside the Croft State Natural Area. The Creek Golf Course is located on the north end of Camp Croft.

2.7.1.5 Numerous small wetlands and riparian areas are located in the northern portion of the FUDS. The southern portion of the FUDS is dominated by numerous larger wetlands, primarily along Fairforest Creek. The largest wetland in the southern portion of the FUDS is 82.85 acres and is located southwest of Lake Craig.

2.7.1.6 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

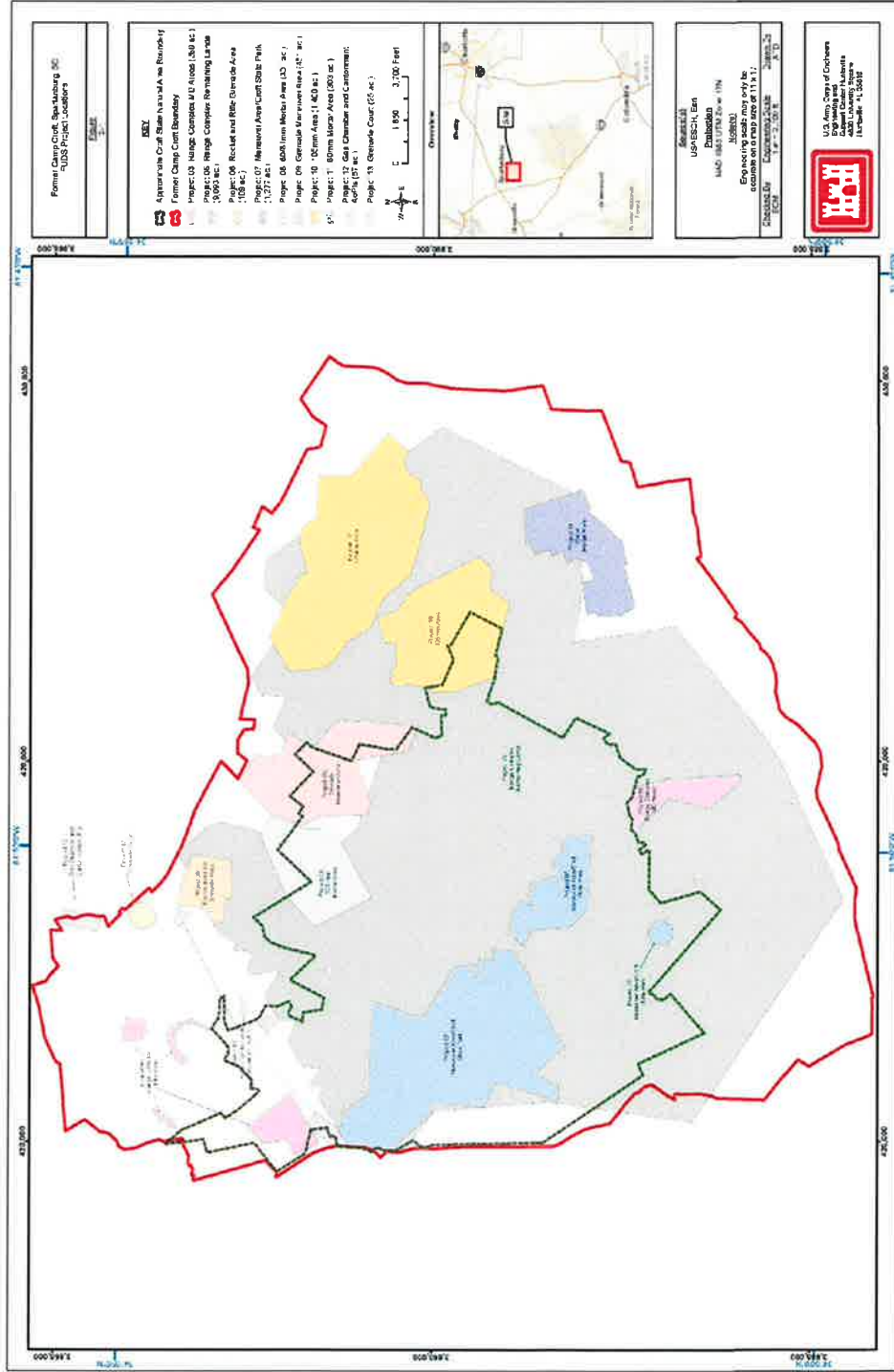
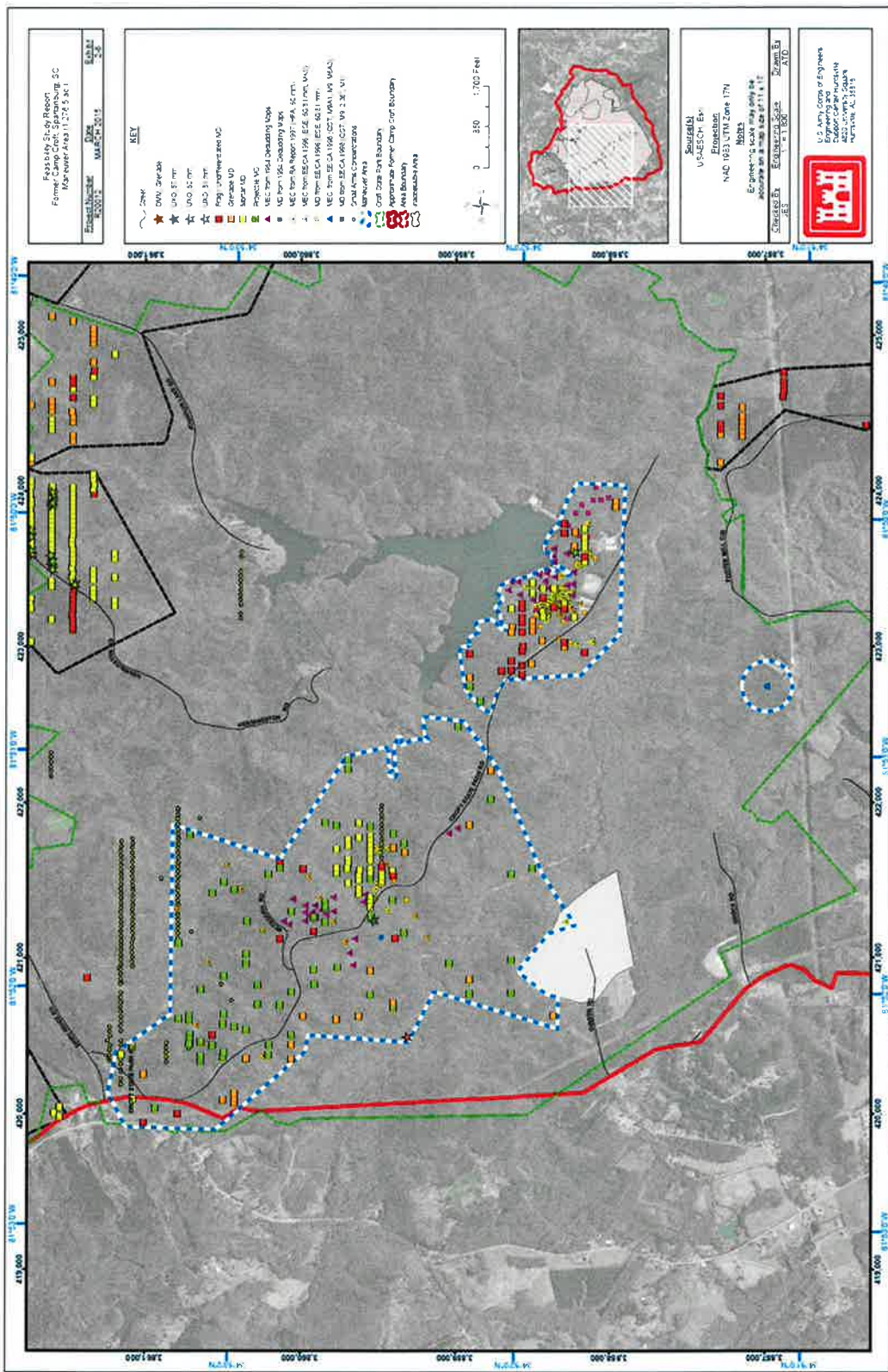


Figure 2-2 Phase II EE/CA and Removal Actions



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 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 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 collect composite post-BIP soil samples.

2.7.2.4 Groundwater in this area is not expected to be part of a complete exposure pathway to receptors at this site, and therefore was not sampled.

2.7.3 Project 07

2.7.3.1 *Maneuver Area* – During the RI, four types of munitions (i.e., 60 mm and 81 mm mortars, 57 mm projectiles, and MKII grenades) that were determined to be MEC and MD from these munitions were recovered during the RI. Munitions were recovered from a maximum depth of eight inches bgs.

2.7.4 Location of Munitions and Potential Routes of Migration

2.7.4.1 Camp Croft had at least 12 operational ranges 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 range were also located at the camp. Not all of the training range impact area is included in the Camp Croft FUDS.

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

2.7.4.3 Human populations which could be affected include recreational users 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 a continually changing land mass, running into agricultural, grasslands and forested areas, continually altering its boundaries in response to changes brought by growth and development. Land use in Project 07 is Croft State Natural Area.

2.8.1.2 Croft State Natural Area occupies approximately 7,054 acres of the 19,044 acre Camp Croft FUDS property. The 1,277 acres of Project 07 lie within the Croft State Natural Area. The primary activities conducted at the park include hiking, mountain biking, camping, fishing, boating, and horseback riding. The park hosts horse shows on the third Saturday of each month between February and November. Bow hunting is allowed during three two-day sessions between September and November. It is not anticipated that land use at Croft State Natural Area will change. Land use for the remainder of Camp Croft FUDS (approximately 11,990 acres) is composed of industrial, agricultural, commercial, and residential. It is likely those types of land use will continue in the future.

2.8.2 Groundwater and Surface Water Uses

2.8.2.1 Groundwater in this area is not expected to be part of a complete exposure pathway to receptors at Project 07; no potable groundwater wells were identified within Project 07.

2.8.2.2 Lake Craig (148 acres) and Lake Johnson (37.5 acres), both located within Croft State Natural Area, are used by boaters and fishers.

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 (MEC HA)

2.9.2.1 USACE completed a qualitative MEC 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 Project 07. Results of the hazard assessment 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 Project 07 is implementation of 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 public 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 Remedial Action Objective (RAO) is to limit or mitigate an interaction between a receptor and potential munitions that may remain present within Project 07. The selected remedy is chosen to satisfy the RAO. A removal to a depth of two feet below ground surface, as shown on Table 2-2, is based on the depth at which munitions determined to be MEC were recovered and the current and reasonably anticipated land use plus a buffer of 1 foot. This response action reduces the volume of munitions present, thus reducing the potential for an encounter with MEC at Project 07.

TABLE 2-2 REMEDIAL ACTION OBJECTIVES (RAO)

Area	MEC Depth (bgs)	Land Use/ Depth (bgs)	RAO Depth (bgs)
Maneuver Area/Croft State Park	8 in.	Recreation/1 ft	2 ft

2.11 DESCRIPTION OF ALTERNATIVES

2.11.1 The FS developed and evaluated four remedial alternatives for Project 07:

- Alternative 1 – No Action;
- Alternative 2 – Land Use Controls (e.g., fencing and signage) and Implementation of a 3Rs Explosives Safety Education Program (3Rs Program);
- Alternative 3 – Analog Supported Surface and Subsurface Munitions Removal and Implementation of a 3Rs Program; and
- Alternative 4 – Advanced Geophysical 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 action to remove MEC 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
- Development, if needed, and distribution of 3Rs Program informational material.

2.11.2.3 Alternative 3 – Analog Supported Surface and Subsurface Munitions Removal and 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;
- Development, if needed, and distribution of 3Rs Program informational material;
- Removal of munitions visible on the ground surface; and
- Investigation of subsurface anomalies identified by analog sensors to 2 ft.
- Use of Advanced Geophysical Classification where technically feasible*

*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. The use of Advanced Geophysical Classification is a change that USACE made after the PP was finalized based on new information which was coordinated with SC DHEC. This is discussed in Section 2.16.

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

- Funding and implementation by USACE;
- Removal of munitions visible on the ground surface; and
- Use of advanced digital geophysical mapping and advanced geophysical classification to identify subsurface anomalies that may be a munition, investigation of 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 2 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	<i>Migratory Bird Treaty Act (16 U.S.C. § 703), and Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d)</i>	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	<i>40 C.F.R. § 264.601</i>	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, it offers no permanent remedy.

2.11.4.2 Alternative 2 – Implementation of Land Use Controls 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 affect behavior to reduce the potential for an encounter with a munition to result in serious injury or death.

2.11.4.3 Alternative 3 – Analog Supported Surface and Subsurface Munitions Removal and 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 – Advanced Geophysical Classification Supported Surface and Subsurface Munitions Removal to Support UU/UE would provide permanent reduction of hazard for recreational visitors by performing intrusive activities in areas where present and future land use dictates and remove munitions.

2.11.5 Estimated Time to Implement

2.11.5.1 Alternative 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 Analog Supported Surface and Subsurface Munitions Removal and Land Use Controls, including a 3Rs Program, to be completed is 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 Land Use Controls portion of this alternative can be implemented within six months.

2.11.5.4 Alternative 4 – A Advanced Geophysical 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. Implementation of 3Rs Program	\$1,038,012
3. Analog Supported Surface and Subsurface Munitions Removal and Implementation of 3Rs Program	\$43,822,955
4. Advanced Geophysical Classification Supported Surface and Subsurface Munitions Removal to Support UU/UE	\$106,416,982

* 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. Though not part of the remedy, the cost of five-year reviews is included where applicable to determine total cost.

2.11.7 Expected Outcomes of Each Alternative

Alternative 1 affords no protection to human health and is not effective in reducing potential for an encounter with munitions at Project 07. 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.

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 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 Advanced Geophysical 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 Advanced Geophysical Geophysical Classification where technically feasible. Suspected MEC items would be inspected for explosive hazards and disposed of accordingly.	\$43,822,955 \$44,066,146 (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 Advanced Geophysical 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 Advanced Geophysical Classification to a depth compatible with land use or actual known depths of the ordnance (determined to be 1 foot 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 Advanced Geophysical 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.	\$106,416,982	The State provided comment on the acceptability of this Alternative.	No comments from the public were received.

2.13 PRINCIPAL MEC/MC ISSUES

The principal concern at Project 07 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 analog methods and advanced geophysical classification to detect anomalies, investigating anomalies that may be munitions or that cannot be discriminated from non-munitions, and removing and destroying munitions that are determined to be MEC. For any remaining munitions, Land Use Controls will be implemented

2.14 SELECTED REMEDY

The selected remedy for Project 07 is Analog Supported Surface and Subsurface Munitions Removal and Implementation of Land Use Controls, to include a 3Rs Program. Due to comments from the SC DHEC at the Proposed Plan phase (see Part 3: The Responsiveness Summary) and concurrence with those comments by USACE, Alternatives 3 was modified to include Advanced Geophysical Classification where technically feasible. USACE evaluated and identified Advanced Geophysical Classification as the preferred alternative in the Proposed Plan. Therefore, all elements of the selected remedy were evaluated and subjected to public comment.

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 monitoring, is appropriate for FUDS Project I04SC001607. 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 Project 07 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, which is to reduce the unacceptable risk due to the presence of munitions explosives of concern, is protective of human health and the environment and satisfies the statutory requirements of CERCLA, including selecting a remedy that is protective of human health and the environment; that complies with ARARs; that is cost effective; that uses permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and that satisfies the preference for treatment as a principal element.

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 Land Use Controls, including 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 either analog method or digital geophysical mapping where technically feasible. Advanced classification of the digital geophysical data would identify targets-of-interest for intrusive investigation. Such subsurface targets-of-interest shall be removed and includes anomalies that are most likely munitions and anomalies that cannot be discriminated from non-munitions. 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 \$43,822,955. 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 expected land use for the site as 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 munitions encountered 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 prefer 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 Project 07 through the removal of munitions and destruction of munitions that may be determined to be MEC. The actual known depth of munitions and MD is less than one foot below ground surface. Based on the current or reasonably anticipated

land use, munitions will be removed from the surface and subsurface to a depth of two feet below ground surface (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 any unacceptable short-term risks 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 Project 07 at a reasonable cost compared to the other alternatives and with less environmental impacts than Alternative 4.

2.15.4 Permanent Solution and Alternate Technology

The permanence of the selected remedy is extremely effective as a long-term remedy given munitions that are encountered are removed from Project 07.

2.15.5 Preference for Treatment as a Principal Element

The selected remedy includes 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 monitor the effectiveness of the remedy. 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 - Advanced Geophysical Classification Supported Surface and Subsurface Munitions Removal to Support UU/UE - as the preferred alternative for FUDS Project I04SC001607: Maneuver Area/Croft State Park (Project 07).

2.16.2 Recognizing that the Project 07 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 Alternative 3 - Analog Surface and Subsurface Munitions Removal and Land Use Controls to include the use of Advanced Geophysical Classification where technically feasible. Statutory 5 years reviews will be conducted.

2.16.3 The cost estimate for Alternative 3 in the 2015 Feasibility Study was \$10,532,925. 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 Project 07. 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 \$ 43,822,955. The cost increase 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 Advanced Geophysical 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 Advanced Geophysical Classification within the PP's Alternative 4. In addition, information in the PP indicated there are impediments to the use of Advanced Geophysical 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 Feasibility Study, 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 - Analog Surface and Subsurface MEC Removal and Land Use Controls, including a 3Rs Education program, will be used but updated to include the use of Advanced Geophysical 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, 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 insure all targets of interest (TOI) were investigated. The RAO depth for Project 07 is set to account for depths of munitions encountered during the RI plus a buffer. All TOI should be identified within this depth. However, if potential TOI are identified deeper, in order to support UU/UE, 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 2.7.1.6 addresses nesting bald eagles; Table 2-3 identifies ARARs, including the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act.

SC DHEC reviewed this Decision Document and provided its concurrence with the selected remedy via letter dated 28 August 2019.

3.2 TECHNICAL AND LEGAL ISSUES

No technical or legal issues have been identified.