

**FINAL
DECISION DOCUMENT**

DEMONSTRATION RANGE (EAST) MRS

FORMER PINECASTLE JEEP RANGE

ORANGE COUNTY, FLORIDA

MRS Project No. I04FL40503



U.S. Army Corps of Engineers

June 2011

Final Decision Document
Demonstration Range (East) MRS
MRS # I04FL40503
Former Pinecastle Jeep Range, Orange County, Florida

EXECUTIVE SUMMARY

ES.1. This Decision Document contains the selected remedy for the Demonstration Range (East) Munition Response Site (MRS) (MRS No. I04FL40503) of the former Pinecastle Jeep Range, Formerly Used Defense Site (Property No. I04FL0405) located in Orange County, Florida. This MRS is comprised of a mixture of upland and wetland areas with commercial development occurring along Lee Vista Boulevard. The eastern portion of this MRS contains part of the Orange County Solid Waste Management Facility landfill.

ES.2. The selected remedy for this MRS includes explosives safety support during large projects involving excavation, a public education program for site workers, and five-year reviews of the prescribed actions for effectiveness and applicability. Five potential response alternatives were presented and included a range of efforts including No Department of Defense Action Indicated and unexploded ordnance (UXO) and munitions constituent (MC)-contaminated soil removal. Although no UXO were recovered during the RI activities conducted at the Demonstration Range (East) MRS, six UXO were recovered during other investigations of the Beltway Commerce Center and at the Orange County Solid Waste Management Facility within the MRS. Since this MRS has a relatively large acreage with commercial, industrial, and institutional land use and low UXO density, a removal action would not be warranted or cost effective.

ES.3. The selected remedy is appropriate for the Demonstration Range (East) MRS which has a low UXO density and an expected commercial and industrial future land use. Assuming that UXO are discovered as a result of any explosives safety support conducted by developers or other entities, there will be a reduction in toxicity, mobility, and volume of UXO and MC through their removal. The selected remedy is likely to be acceptable to the regulators and the community because it is protective of human health and the environment. The remedy achieves the balancing factors of long-term effectiveness, permanence, and reduction of toxicity, mobility, and volume through UXO and source removal within these areas.

ES.4. The expected cost associated with the selected remedy for this MRS is \$1,375,248.

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LIST OF ACRONYMS

ASR	Archives Search Report
ARAR	applicable or relevant and appropriate requirements
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CESAJ	U.S. Army Corps of Engineers – Jacksonville District
CFR	Code of Federal Regulations
CSM	conceptual site model
CSEM	conceptual site exposure model
DD	Decision Document
DERP	Defense Environmental Restoration Program
DMM	discarded military munitions
DoD	Department of Defense
FDEP	Florida Department of Environmental Protection
FUDS	Formerly Used Defense Site
FS	Feasibility Study
HE	high explosive
HVAR	high-velocity aircraft rockets
INPR	Inventory Project Report
MC	munitions constituents
MD	munitions debris
MEC	munitions and explosives of concern
MRS	Munitions Response Site
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NDAI	No DoD Action Indicated
O&M	operations and maintenance
RAB	Restoration Advisory Board
RAO	Remedial Action Objective
RCRA	Resource Conservation and Recovery Act
RI	remedial investigation

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SARA	Superfund Amendments and Reauthorization Act of 1986
SI	Site Inspection
TBC	to be considered
TCRA	time-critical removal action
USACE	U.S. Army Corps of Engineers
USC	U.S. Code
USEPA	U.S. Environmental Protection Agency
UXO	unexploded ordnance

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PART 1: THE DECLARATION

1.0 Project Name and Location

The Pinecastle Jeep Range, Formerly Used Defense Site (FUDS) (FUDS Property No. I04FL40503) is located in Orange County, Florida. The Demonstration Range (East) Munitions Response Site (MRS) (MRS I04FL040501R03) is located in the east central portion of the former Pinecastle Jeep Range east of State Highway 417 and is comprised of a mixture of upland and wetland areas with commercial development occurring along Lee Vista Boulevard. The eastern portion of this MRS contains part of the Orange County Solid Waste Management Facility landfill. The location of the MRS is shown in Figure 1.

2.0 Statement of Basis and Purpose

2.1. This Decision Document is being presented by the United States Army Corps of Engineers (USACE) to describe the Department of Defense (DoD) selected remedy for the Demonstration Range (East) MRS of the former Pinecastle Jeep Range FUDS in Orange County, Florida. The FUDS Charter designated the Army as the Executive Agent on behalf of the DoD charged with meeting all applicable environmental restoration requirements at FUDS, regardless of which DoD component previously owned or used the property. The Secretary of the Army further delegated the program management and execution responsibility for FUDS to the USACE. The USACE is the lead agency for investigating, reporting, evaluating and implementing remedial actions at the former Pinecastle Jeep Range.

2.2. This Decision Document is a requirement of 42 U.S. Code (USC) § 9617 of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), also known as Superfund, and follows the requirements from Engineer Regulation 200-3-1, Formerly Used Defense Site Program Policy (USACE, 2004) and the United States Environmental Protection Agency (USEPA) guidance provided in A Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents, EPA 540-R-98-031 (USEPA, 1999).

2.3. The remedy described in this Decision Document was selected in accordance with CERCLA, 42 USC § 9601 et seq., as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986, and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 Code of Federal Regulations (CFR) Part 300 et seq., as amended. The Administrative Record provides supporting documentation for this decision.

3.0 Assessment of Project MRS

An evaluation of site data indicates that Munitions and Explosives of Concern (MEC)—specifically unexploded ordnance (UXO)—is present at the Demonstration Range (East) MRS and that risk is associated with the large number of people who potentially access the MRS on a daily basis. The Demonstration Range (East) MRS contains several warehouses and portions of the MRS are undergoing development for other commercial and industrial uses. The Orange County Solid Waste Management Facility also employs workers who work within the part of the landfill within this MRS. If present and acted upon, UXO is a safety hazard and constitutes an imminent and substantial endangerment to on-site personnel. MC risk for the Demonstration Range (East) MRS was not evaluated since MC sampling was not conducted due to lack of UXO finds during the RI.

4.0 Description of Selected Remedy

4.1. The following remedy has been selected for the Demonstration Range (East) MRS and will be conducted under CERCLA requirements in accordance with applicable state and federal requirements:

- Provide MEC safety education materials to developers or other contractors performing excavation activities. Encouraging local contractors and developers to procure UXO-qualified personnel for explosives safety support during excavation activities could be a tool which ensures local governments that encountered UXO are identified and dealt with properly; and
- Five-year Reviews – require that the chosen alternative is reviewed every five years for effectiveness and applicability.

4.2. The remedial investigation (RI) completed in 2010 characterized the nature and extent of MEC and of munitions constituents (MC) associated with the former military activities (e.g. ranges). MEC and MC were found to exist within the former ranges of the Pinecastle Jeep Range, specifically within the central/western portion of the site. To address the potential for MEC and MC contamination, the Pinecastle Jeep Range FUDS was divided into four MRSs based on the results of the RI, and on the land use. Specifically, the Demonstration Range (North) MRS was found to contain risks associated with UXO, discarded military munitions (DMM), and MC and contained residential areas and a school. The Demonstration Range (South) and Demonstration Range (East) MRSs contained UXO and MC risks; however the (South) MRS is primarily comprised of wetlands and open pasture while the Demonstration Range (East) MRS contains wetlands, commercial developments, and industrial facilities—primarily the Orange County Solid Waste Management Facility. The Remaining Area MRS was found to contain no risks

associated with UXO and MC and No DoD Action Indicated (NDAI) was selected as the remedy for that MRS.

5.0 Statutory Determinations

Based on the information currently available, the selected remedy for the Demonstration Range (East) MRS is protective of human health and the environment and satisfies the statutory requirements of CERCLA §121(b) regarding former use by the DoD. 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 to the maximum extent practicable. Reviews conducted every five years will evaluate the effectiveness of the remedy as well as the continued applicability.

6.0 Data Certification Checklist

6.1. The following information is included in the Decision Summary section of this Decision Document:

- UXO type, occurrence, and density. MC was not identified due to the limited occurrence of UXO.
- Baseline risk represented by the UXO. MC risks were not identified.
- Criteria for the reduction and control of UXO hazards.
- How UXO will be addressed.
- Current and reasonably anticipated future land use assumptions and current and potential future beneficial uses of groundwater used in the baseline risk assessment and Decision Document.
- Potential land and groundwater use that will be available at the site as a result of the selected remedy.
- Estimated capital, annual operation and maintenance (O&M), and total present worth costs, discount rate, and the number of years over which the remedy cost estimates are projected.
- Key factors that led to selecting the remedy at the Demonstration Range (East) MRS.

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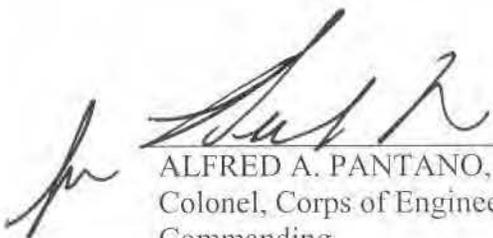
6.2. Additional information can be found in the Administrative Record file for this site.

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7.0 Authorizing Signatures

This Decision Document presents the selected response action at the Demonstration Range (East) MRS at the former Pinecastle Jeep Range in Orange County, Florida. The US Army Corps of Engineers is the lead agency under the Defense Environmental Restoration Program at the Pinecastle Jeep Range Formerly Used Defense Site, and 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 Decision Document will be incorporated into the larger Administrative Record file for the former Pinecastle Jeep Range, which is available for public view at 5575 S. Semoran Blvd., Orlando, Florida. This document, presenting a selected remedy with a present worth cost estimate of \$1,375,248, is approved by the undersigned, pursuant to Memorandum, DAIM-ZA, September 9, 2003, subject: Policies for Staffing and Approving Decision Documents (DD), and to Engineer Regulation 200-3-1, Formerly Used Defense Sites Program Policy.

APPROVED:



ALFRED A. PANTANO, JR.
Colonel, Corps of Engineers
Commanding

PART 2: THE DECISION SUMMARY

1.0 Project Name, Location, and Brief Description

1.1. The site addressed in this Decision Document is the Demonstration Range (East) MRS (MRS No. I04FL40503) within the former Pinecastle Jeep Range, FUDS Property No. I04FL0405. The USACE is the lead agency for investigating, reporting, evaluating, implementing, and funding remedial actions at the project site. The source of funding for the selected remedy is the FUDS Program. The Florida Department of Environmental Protection (FDEP) has been a supporting agency of this process, having reviewed and commented on planning documents and the remedial investigation/feasibility study (RI/FS) report.

1.2. The former Pinecastle Jeep Range is located approximately three miles east-northeast of the Orlando International Airport in Orange County, Florida. Specifically, the Demonstration Range (East) MRS is comprised of a mixture of upland and wetland areas with commercial development occurring along Lee Vista Boulevard (Figure 1). The eastern portion of this MRS contains part of the Orange County Solid Waste Management Facility.

2.0 Project Site History and Enforcement Activities

2.1 Site History

2.1.1. The U.S. Government established the Pinecastle Jeep Range during 1943 when it leased approximately 12,483 acres for use by the Army Air Corps. The property was also known as the Tactical Demonstration Range, the Orlando Range, Pinecastle Range, Pinecastle Bombing Range and Pinecastle Chemical Demonstration Range, and was an off-post, or auxiliary site, of Pinecastle Army Air Field—the predecessor to McCoy Air Force Base. Although a sub-installation of the Pinecastle Army Air Field, a number of elements of the Army Air Force Tactical Center headquartered at Orlando Army Air Base used the facility for gunnery range training. The Army Air Forces School of Applied Tactics used the site for Combined Tactical Demonstration exercises for student instruction in employment of aerial weapons. Pinecastle Jeep Range was initially used for small arms training with a Jeep Range for .50 caliber machine gun training, a 45-position rifle range, and a separate 15-target rifle range. The curriculum of the school contained at least four choreographed munitions demonstration programs which took place in front of students and observers situated on bleachers nearby. These demonstrations included ordnance demonstrations, convoy strafing demonstrations, chemical warfare demonstrations (using chemical agent simulant), and tactical air forces demonstrations.

2.1.2. The War Department declared the Pinecastle Jeep Range surplus effective December 2, 1946, and by December 5, 1947, the War Department terminated the lease on the range property. Range clearance activities were conducted at the former Pinecastle Jeep Range from March to September 1947 and during the summer of 1948. On August 6, 1948, the War Department terminated the lease with Magnolia Ranch, Inc. for the majority of the range (11,833

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acres). Magnolia Ranch, Inc. subsequently filed damage claims and sued the government in the United States Court of Claims in 1952. An additional UXO clearance effort occurred in 1953, and the case was settled in 1955. The ordnance clearances conducted in April and June 1953 resulted in a recommendation that a 500-acre area be restricted to surface use only based on the surface clearance completed. This area included a small portion of the Demonstration Range (North) MRS, specifically the eastern portion of the Odyssey Middle School, the wetlands between Odyssey Middle School and Tivoli Gardens, and the southwestern portion of Tivoli Woods. There was no subsequent documentation that the restricted area was implemented. No records of munitions finds since the 1953 clearance activity until 2009 have been located.

2.2 Previous Investigations

2.2.1. Following the CERCLA process, the USACE has completed a series of studies for the former Pinecastle Jeep Range.

2.2.2. An Inventory Project Report (INPR) was completed in 1994 to determine the eligibility for the Pinecastle Jeep Range under FUDS, establish the preliminary site boundary, assign the FUDS project number, and evaluate whether further action was warranted.

2.2.3. An Archives Search Report (ASR) was completed in 1997 based on available historical records, interviews, and a site visit. The site visit team was not able to access undeveloped areas in the western portion of the site but potential bomb craters were noted from aerial photographs. In 2004, an ASR Supplement was prepared based on the 1997 ASR to form a preliminary conceptual site model (CSM) and to establish areas of concern.

2.2.4. A Site Inspection (SI) was conducted in 2007 to determine if there was evidence of remaining munitions at the former Pinecastle Jeep Range. During the SI several bomb craters and MD were discovered, and soil samples were collected which contained concentrations of explosives compounds. In June 2007, several live munitions were discovered and subsequently destroyed by military personnel from Patrick Air Force Base. The discovery of these munitions led to a time-critical removal action (TCRA) that began in August 2007 resulting in more munitions and munitions debris being discovered in several areas within the former Pinecastle Jeep Range, including at the Odyssey Middle School, Tivoli Gardens, and a northern portion of the Mockingbird Property adjacent to Odyssey Middle School.

2.2.5. Prior to the completion of the TCRA in July 2008, an RI was initiated to characterize the location, concentration, and extent of UXO and MC contamination at the site. To assess the presence of UXO at the project site, a geophysical survey was conducted to detect anomalies similar in characteristics to the munitions formerly used. The team selected 51,010 anomalies throughout the FUDS for investigation and found UXO at 20 locations and munitions debris (MD) at 599 locations. The remaining category of 50,391 locations consisted of non-munitions debris (e.g., construction debris, sprinklers, etc.), small arms projectiles, anomalies caused by

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instrument noise or rough terrain, and anomalies which became unavailable due to flooding or a retraction of permission to enter a property.

2.3 CERCLA Enforcement Activities

To date, there have been no CERCLA-related enforcement activities at the project site.

3.0 Community Participation

3.1.1. In an effort to keep the public informed, public meetings relating to activities within the former Pinecastle Jeep Range were held on four occasions. The public meetings were designed to present the investigation schedule for the site and also to receive questions regarding investigation activities and to solicit views on the reasonably anticipated land uses and potential future land uses of the MRS. Fact sheets were prepared and distributed during these meetings.

3.1.2. A Restoration Advisory Board (RAB) was established for the former Pinecastle Jeep Range in an effort to maintain representatives of the community as stakeholders of the project. The RAB members were allowed to review and comment on site documents before their release to the public. During the RI/FS, ten RAB meetings were held in an effort to include these community representatives in the investigation remedial alternative evaluation process for the site.

3.1.3. A news release was issued on July 18, 2010, to announce the completion of the final RI/FS Report and Proposed Plan. A draft final version of the Proposed Plan was issued on July 22, 2010. The Proposed Plan was posted on the USACE-Jacksonville District (CESAJ) website and placed in the local administrative repository with the RI/FS Report and other documents for the site. The USACE sent a letter to all property owners within the boundary of the FUDS that explained the results of the RI/FS Report and the CERCLA process. The local residents and other interested parties were encouraged to review the Proposed Plan and submit comments during their attendance at the July 22, 2010 Public Meeting. Public comments on the Proposed Plan were accepted during a 30 day public review and comment period (i.e., July 22 – August 23, 2010).

4.0 Scope and Role of Response Action

4.1. Similar to many FUDS, the problems at the former Pinecastle Jeep Range are complex. As a result, the USACE has organized the site into four MRSs to facilitate the cleanup. These four MRSs are as follows:

- Demonstration Range (North) MRS;
- Demonstration Range (South) MRS;

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- Demonstration Range (East) MRS; and
- Remaining Area MRS.

4.2. The USACE has selected the remedies for these MRSs. Apart from the Remaining Area MRS, which has been selected for NDAI, the three Demonstration Range MRSs have been prescribed similar remedies with the goal of reducing the number of UXO and the amount of MC contamination. The MRSs were divided accordingly due to their different land uses, each mandating a different approach in order to achieve their respective remediation goal. Whereas the Demonstration Range (North) MRS includes residential properties, a school, and wetlands, the other MRSs contain either open pastures and wetlands (Demonstration Range (South) MRS) or wetlands, commercial developments, and a large landfill facility (Demonstration Range (East) MRS). Separate Decision Documents have been created for each MRS to address the specific characteristics of each, as well as to present their selected remedy.

4.3. This document addresses UXO contamination within the Demonstration Range (East) MRS. UXO were not encountered in the Demonstration Range (East) MRS during the RI; however, UXO were discovered within this MRS by other contractors conducting removals and investigations. Since UXO was not discovered during the RI, MC sampling was not conducted at this range (the other areas not being accessible due to lack of right of entry or construction). Data on MC were insufficient for a risk assessment to be conducted. This does not translate to a conclusion of no unacceptable risk since it is known that UXO is present in areas of this MRS that were not accessible during the RI.

- Provide MEC safety education materials to developers or other contractors performing excavation activities. Encouraging local contractors and developers to procure UXO-qualified personnel for explosives safety support during excavation activities could be a tool which ensures local governments that encountered UXO are identified and dealt with properly; and
- Five-year Reviews – Review the chosen alternative every five years for effectiveness and applicability.

4.4. The USACE cannot require Orange County to conduct remedial actions; however, the county has placed restrictions on building permits requiring certification that a site has been thoroughly inspected and examined and free or cleared of munitions (Orange County Commission Resolution No 2008-M-11). The USACE would provide explosives safety education materials to support the county program. For situations where construction activities require excavation, explosives safety support would be implemented in the form of one or more UXO-qualified technicians hired by the contractor conducting the excavation activities. The UXO-qualified technician(s) would brief the contractor, management, or construction team on the probable site hazards, procedures when UXO are encountered, responsibilities and lines of

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UXO are encountered, responsibilities and lines of authority for MEC response, and emergency response procedures. The technician(s) could either be present onsite at the point of excavation for the duration of the ground-breaking activities or could also serve on a “on call” basis. Examples of ground-breaking activities would include surveying, installation or maintenance of underground utilities, and installation of fence posts. The UXO technician(s) would be available to identify suspect munitions and determine if emergency responders need to be notified.

4.5. As part of this alternative, an educational awareness program would be implemented and would consist of development of educational tools and materials and continuation of the outreach campaign that the USACE conducted during the RI projects. Reports, fact sheets, and other information would also be posted to the project website maintained by the USACE. Materials will be prepared by the USACE for distribution by the local governments to contractors seeking permits. Five-year reviews would also be conducted to determine if the response action continues to minimize explosives safety risks and continues to be protective of human health, safety, and the environment.

5.0 Project Site Characteristics

5.1 Conceptual Site Model

5.1.1. The RI did not identify UXO within the Demonstration Range (East) MRS; however, contractors conducting UXO clearances (required by Orange County for landowners to obtain building permits) discovered UXO during the investigations. Since additional UXO are anticipated to remain, the MEC exposure pathway is considered complete for MEC on the surface and in subsurface soil. Review of the data from historical records and RI fieldwork indicate that the Demonstration Range (East) MRS did not contain military weapons training areas and demonstration targets, instead UXO are present due to the MRS being within the training and demonstration range fans. MC risk was not assessed in this MRS during the RI, due to the inability to access areas where UXO was found. Potentially complete exposure pathways for UXO and MC in the surface soil are presented in the Conceptual Site Model (CSM) shown in Figure 2.

5.1.2. A Jeep Track was constructed (with the northern half being within the Demonstration Range (North) MRS and the southern half being within the Demonstration Range (South) MRS) for training of aircrews with small arms (.30 and .50 caliber machineguns) against a moving target that moved behind berms at the Jeep Track. The Jeep Track range fan was pointed due east (to the Demonstration Range [East] MRS). Demonstrations in that area specifically included the use of bazookas (2.36-inch rockets – practice and high explosive [HE]) and various calibers of anti-aircraft artillery (37mm to 90mm) being demonstrated by being fired horizontally to the east. High velocity aircraft rockets (5” HVAR) were also fired to the east from an aircraft parked on the ground. These demonstrations to the west of this MRS resulted in an occasional munition overshooting its designated target and entering the limits of the range fan. This

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understanding of the Demonstration Range (East) MRS was supported by the small amount of UXO and MD identified from the contractors and the small amount of MD discovered during the RI.

5.1.3. Construction in this MRS has focused on two main areas – along both sides of the extension of Lee Vista Boulevard from State Highway 417 on the west to Young Pine Road to the northeast, and at the Orange County Solid Waste Management Facility. Along Lee Vista Boulevard, a series of warehouses and office parks were constructed using the typical method for this area that involves excavation of soil to create retention ponds and spreading the soil to raise the upland areas where buildings, roads, and parking areas are constructed. At the waste management facility, construction proceeds by creating new landfill cells which use soil from adjacent borrow areas to create the base for the landfill cells and to cover the waste. In both areas, existing wetlands are generally left undisturbed.

5.1.4. Since the UXO at this MRS had a very low density and very scattered distribution, MC risks were not identified and, if present in association with the remaining UXO, would be very localized.

5.1.5. The overall CSM for the Demonstration Range (East) MRS consists primarily as the further reaches of a range fan for small arms and for demonstration range activities conducted to the west. Munitions fired to the east from that area would normally have impacted at their targets; however, an occasional overshoot resulted in the UXO which were found in the Demonstration Range (East) MRS.

5.2 Site Overview

The Demonstration Range (East) is comprised of 1501-acres in the eastern section of the former Pinecastle Jeep Range FUDS. This area consists of everything east of the western right-of-way of Highway 417 and includes commercial, industrial, and institutional land use. The Orange County Solid Waste Management Facility is also located within this MRS. There are no areas of archeological or historical importance within this MRS.

5.3 UXO Investigation

5.3.1. UXO were found in the Demonstration Range (East) MRS by other contractors conducting removals and investigations. During the clearance of 74 acres at the Beltway Commerce Center along Lee Vista Blvd., UXO were encountered in the form of one 40mm HE projectile, two 5" HE HVARs, and two 20mm HE projectiles. The intrusive investigation of geophysical anomalies at the Orange County Solid Waste Management Facility Southern Expansion area encountered one 40mm HE projectile. The RI did not encounter any UXO although one 40mm projectile was detonated and subsequently determined to be inert. The most dangerous type of munition found is the 5" HVAR which can be lethal if it detonates. Depths of the munitions are unknown as this information was not provided by the contractors encountering

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the UXO. However, the inert 40 mm projectile located at the landfill southern expansion area was encountered at a depth of three inches. MD was found in this MRS ranging from surface to 48 inches for 5" HVAR debris found in the landfill southern expansion site. The depth of UXO for this MRS should be considered "surface" and "subsurface." Expended .50-caliber small arms ammunition was also found at the site. However, expended small arms ammunition is classified as munitions debris and poses no explosive hazard.

5.3.2. The approximate density of UXO found at the Demonstration Range (East) MRS was calculated using the number of UXO encountered (6) and the acreage of the area investigated (172 acres) during the RI and by other contractors (Table 1). The density of UXO and DMM found ranges from 0 to 0.07 UXO/acre for individual investigation areas. The average UXO density for the overall area investigated is 0.03 UXO/acre. Although a density of zero UXO/acre was computed for some areas, it has not been confirmed that no UXO are present in these areas, only that the density is relatively low.

5.3.3. The average density of UXO found is low (estimated to be approximately 0.03 UXO/acre) relative to the other Demonstration Range MRSs. Based on this estimated UXO density and the acreages of the MRS, approximately 40 UXO might be present in the remaining 1,332 acres of the 1,501-acre Demonstration Range (East) MRS. This number does not consider that some of these munitions might be inaccessible due to the presence of wetlands. Therefore, this estimated UXO density is expected to be somewhat conservative.

Table 1
UXO Density for Demonstration Range (East) MRS

Area - Investigation	Number of UXO Found	Total Acreage	Approx. Density of UXO Found (UXO/acre)
Beltway Commerce Center – MMG	5	74	0.07
Cell 10 – Southern Expansion (Landfill) - CH2M/WCG	1	81	0.01
Cells 11 and 12 – Southern Expansion (Landfill) – CH2M/WCG	0	14.1 (10% coverage of 141 acres)	0
Transects and Grid - RI	0	2.6	0
Total	6	172	0.03

Source: Final Remedial Investigation Report for the former Pinecastle Jeep Range and Time Critical Removal Action Report.

Although a density of zero UXO/acre was computed for some areas, this should not be interpreted to mean that no UXO are present in these areas, only that the density is relatively low.

5.4 MC Investigation

Since UXO was not discovered during the RI, only limited MC sampling was conducted at this MRS, and a risk assessment for MC could not be conducted. This does not translate to a conclusion of no unacceptable risk since it is known that a low density of UXO is present in areas of this MRS that were not accessible during the RI.

6.0 Current and Potential Future Land and Water Uses

6.1 Land Uses

The Demonstration Range (East) MRS is currently used for commercial and industrial purposes. The area along Lee Vista Boulevard east of Hwy 417 contains commercial developments with warehouses, and the eastern portion of the MRS contains a large county landfill. Lands that are currently undeveloped are expected to be eventually developed as for

commercial and industrial uses. Overall, future land use for this MRS is expected to consist of additional commercial development and expansion of the landfill.

6.2 Groundwater and Surface Water Uses

There are currently no known groundwater wells used for drinking sources or irrigation within the Demonstration Range (East) MRS. Surface water exists within the site as wetlands. Wetland areas are expected to mostly remain undeveloped. Some irrigation water may be taken from local retention ponds which may have water contributed from groundwater.

7.0 Summary of Project Site Risks

7.1 Human Health Risks

7.1.1. The presence of UXO found during previous investigations shows that an explosive safety hazard exists within the Demonstration Range (East) MRS. Depth data were not provided for the Beltway Commerce Center clearance; however, the depth of the 40mm projectile found at the landfill southern expansion was 3 inches. MD was found in this MRS ranging from surface to 48 inches for 5" HVAR debris found in the landfill southern expansion site. The depth of UXO for this MRS should be considered "surface" and "subsurface."

7.1.2. The Demonstration Range (East) MRS has a significantly lower UXO density than the other two Demonstration Range MRSs. The exposure route for UXO receptors is primarily direct contact as a result of some human activity. UXO will tend to remain in place unless disturbed by human or natural forces, such as a buried munition uncovered by soil erosion. Movement of the UXO may increase the probability for direct human contact but not necessarily result in exposure. Workers will be exposed to low levels of UXO hazards at the surface and in the subsurface when conducting excavation activities.

7.2 Ecological Risks

Since UXO was not discovered during the RI, only limited MC sampling was conducted at this MRS, and a screening level ecological risk assessment could not be conducted. This does not translate to a conclusion of no unacceptable risk since it is known that UXO is present in areas of this MRS that were not accessible during the RI. However, a large percentage of this site is occupied by the Orange County Solid Waste Management Facility and associated operations. The industrial nature of this site is likely to preclude or severely diminish ecological consideration in areas affected by landfill operations.

7.3 Basis for Response Action

The response action selected in this Decision Document is necessary to protect the public's health or welfare or the environment from UXO or actual releases of hazardous substances (i.e., MC) into the environment within the Demonstration Range (East) MRS.

8.0 Remedial Action Objectives

8.1. The overall Remedial Action Objective (RAO) is to protect the public and workers within the Demonstration Range (East) MRS. Since the hazards differ between the four MRSs, separate specific RAO statements are provided for each MRS. These RAOs define the measures for the success of the adopted remedial actions. The means for how the actions are implemented will be established during the future remedial design phase.

8.2. The RAOs for the Demonstration Range (East) MRS will be achieved when:

- Measures have been established to protect the public and workers from UXO that may be encountered by site workers, especially during construction activities. Such measures may include fencing, establishing an educational awareness program, or explosives safety support, as appropriate.

9.0 Description of Alternatives

Five remedial alternatives were evaluated during the Feasibility Study for the Demonstration Range (East) MRS. A description of each of the five alternatives developed for consideration is presented below.

9.1 Remedy Components

- **Alternative 1: No Department of Defense Action Indicated (NDAI)** - The NDAI alternative means that a remedy is not necessary to reduce the potential safety risk posed by UXO and MC. Declaration of NDAI on a property or project is a programmatic decision that indicates USACE has determined that no further action is required to address unsafe conditions or hazardous contaminants related to UXO or MC. This alternative, if implemented, would involve continued use of the MRS in its current condition.
- **Alternative 2: Fencing and Signage with Five-year Reviews** (Only applicable to the Demonstration Range (South) MRS) - A six-strand barbed-wire fence, approximately 6 feet high would be installed to close the unfenced southern boundary of the MRS. Existing fencing would be relied upon to close the other sides of the MRS, and would require the landowner of the Demonstration Range (South) MRS to limit access to the MRS. Bilingual warning signs would be

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placed along the entire perimeter of the fence and at all access points. Annual maintenance would be conducted to replace and repair damaged portions of the fence and signs. Five-year reviews would be conducted to determine if the response action continues to minimize explosives safety risks and continues to be protective of human health, safety, and the environment.

- **Alternative 3: Educational Awareness with Five-year Reviews** - This alternative is comprised of an educational awareness program coupled with five-year reviews, and was considered for initial screening at all of the MRSs. An educational awareness program would focus on providing information on the areas containing the UXO and MC hazards and the appropriate response if UXO is encountered. These preventive measures could include educational fact sheets that have the goal of modifying behavior to reduce the risk of exposure and reduce the impact if exposure occurs. In addition, letters and fact sheets would be sent to landowners and residents on parcels in areas identified as having UXO hazards as a result of the RI, and a website containing educational information would be maintained. Five-year reviews would be conducted to determine if the response action continues to minimize explosives safety risks and continues to be protective of human health, safety, and the environment.

- **Alternative 4: Removal of UXO and MC-Contaminated Soil, Explosives Safety Support, Educational Awareness, and Five-year Reviews** - A UXO removal would be conducted over accessible areas. UXO will not be removed from under existing roads, parking areas, structures, or within ponds. Metal detector surveys would be conducted over the entire accessible area and metallic anomalies would be identified for intrusive excavation. During this activity, UXO would be removed to those depths specified in Section 7.1 (4 feet). In undeveloped areas (including wetlands), brush and understory vegetation would be cleared to allow access for the metal detector instruments. Metallic anomalies will be investigated, and if UXO is found, it will be destroyed on site using blow-in-place or consolidate and blow procedures. Completion of the UXO removal will greatly reduce the MEC risk for workers at this MRS by reducing the UXO at the depth ranges most likely to be encountered. During the remedial action, soil samples will be collected at demolition sites and near UXO finds. Removal of MC-contaminated soil will reduce the risk of direct contact by residents and workers. Orange County currently maintains building permit restrictions which require certification (through qualified contractors) that identifies the site as being thoroughly inspected and examined and free or cleared of munitions (Orange County Commission Resolution No. 2008-M-11). The county may continue to impose these restrictions at their discretion or impose additional restrictions. For those areas where construction activities requiring major excavation work will be conducted under existing structures or below the depth of the remedial action, the

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city or county is encouraged to require that contractors procure explosives safety support in order to identify potential UXO hazards during excavation. Educational awareness, similar to that described under Alternative 3, would provide additional protection to receptors by providing information to the public concerning UXO hazards at the site. This would provide reduction in risk from UXO through behavior modification for receptors including residents and workers excavating beyond the depth of the removal. In addition, notices would be published and meetings held to inform residents of UXO remediation activities and to help plan for evacuations where needed. Five-year reviews would be conducted to determine if the response action continues to minimize explosives safety risks and continues to be protective of human health, safety, and the environment.

- **Alternative 5: Remediation of UXO and MC-Contaminated Soil in Upland Areas, Fencing and Signage around Wetlands, Explosives Safety Support, and Educational Awareness with Five-year Reviews** - A UXO removal would be conducted over accessible areas. UXO will not be removed from under existing roads, parking areas, structures, or within ponds. Metal detector surveys would be conducted over the entire accessible area and metallic anomalies would be identified for intrusive excavation. During this activity, UXO would be removed to those depths specified in Section 7.1 (4 feet). Brush and understory vegetation would not be cleared in wetlands. This remedial action would only take place in upland areas. A six-strand barbed-wire fence, approximately 6 feet high would be installed around the wetlands. Bilingual warning signs would be placed along the perimeter of the fence. Annual maintenance would be conducted to replace and repair damaged portions of the fence and signs. Orange County may continue to impose permit restrictions in the affected areas at their discretion. For those areas where construction activities requiring major excavation work will be conducted under existing structures or below the depth of the remedial action, the county is encouraged to require that contractors procure explosives safety support in order to identify potential UXO hazards during excavation. Educational awareness programs and five-year reviews would be conducted in the same manner as described under Alternative 4 and would apply to both upland and wetland areas within the MRSs.
- **Alternative 6: Explosives Safety Support, Educational Awareness, and Five-year Reviews** - For MRSs where a UXO hazard exists but at a lower risk level, explosives safety support procured by developers or other contractors is appropriate in lieu of a UXO removal. Explosives safety support would be implemented in the form of one or more UXO-qualified technicians hired by the contractor conducting the excavation activities. The UXO-qualified technician(s) would be available to brief the contractor, management, or construction team on

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the probable site hazards, procedures when UXO are encountered, responsibilities and lines of authority for MEC response, and emergency response procedures. This technician either could be present onsite at the point of excavation for the duration of the ground-breaking activities or could also serve on a “on call” basis. Examples of ground-breaking activities would include surveying, installation or maintenance of underground utilities, and installation of fence posts. Educational awareness programs and five-year reviews would be conducted by the USACE in the same manner as described in the previous alternatives.

9.2 Common Elements and Distinguishing Features of Each Alternative

- **NDAI (Alternative 1)** does not provide protection of human health or the environment as UXO remains in the impacted areas. While the MC has not been identified as a hazard at this MRS, the explosive risk associated with UXO will remain.
- **Fencing and signage with five-year reviews (Alternative 2)**, like the NDAI alternative, does not remove the UXO hazards; although it does reduce the likelihood of receptor interaction. This alternative is not effective in terms of reducing toxicity, mobility, and volume through treatment. Because of the land uses within the MRS, fencing around the entire MRS is not feasible. However, implementation is technically and administratively feasible, and the services and materials necessary to implement such are readily available. Long term effectiveness will be maintained through fence and sign maintenance along with five-year reviews. This alternative could be implemented in a timely manner (approximately six weeks) with low associated costs for materials. Maintenance of the fence would be conducted annually.
- **Educational awareness with five-year reviews (Alternative 3)** will provide a temporary measure to mitigate potential risks to human health and environment, although UXO hazards remain in the impacted areas. Implementation of this alternative will provide long-term effectiveness through the process of five-year reviews. However, there would not be a reduction of the toxicity, mobility, or volume of potential UXO through treatment.
- **Removal of UXO and MC-Contaminated Soil, Explosives Safety Support, Educational Awareness, and Five-year Reviews (Alternative 4)** would effectively remove UXO and MC contamination within this MRS, however at a higher cost. UXO/MC removal duration in this MRS would last approximately 83-weeks. Demolition of UXO by detonation may introduce additional MC soil contamination which would need to be removed and disposed of properly. Once complete, cleanup levels would have been achieved. Using the current UXO

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density calculations presented in the RI Report, approximately 40 UXO would be destroyed and approximately 3 cubic yards of soil removed for off-site disposal.

- **Removal of UXO and MC-Contaminated Soil in Upland Areas, Fencing and Signage around Wetlands, Explosives Safety Support, and Educational Awareness with Five-year Reviews (Alternative 5)** – similar to Alternative 4, this alternative would effectively remove UXO and MC contamination within the upland areas; however the wetlands would be untouched. The highest likelihood for remaining UXO remains in the wetlands of this MRS. UXO would be removed to a depth of four feet within the upland and developed areas of the MRS. This alternative would occur over approximately 16-weeks, where UXO would be removed from the upland areas, and the wetlands will be fenced (including signage). Five-year reviews of the site would determine the long-term effectiveness of the fenced wetlands. Demolition of UXO may introduce additional soil contamination which would need to be removed and disposed of properly. Using the current UXO density calculations presented in the RI Report, approximately 20 UXO would be removed and destroyed, and approximately 3 cubic yards of soil removed for off-site disposal. However, there would not be a reduction of the toxicity, mobility, or volume of potential MEC within the wetlands.
- **Explosives Safety Support, Educational Awareness and Five-year Reviews (Alternative 6)** will be effective in reducing the hazards from UXO producing knowledge of UXO hazards in the area. Contractors working in the MRS will be educated in regards to these hazards, and of the building restrictions imposed by the local authorities (if maintained) in areas suspected of containing UXO. Information will also be provided for those entities planning major excavations and wishing to obtain information regarding UXO support during excavation activities. Although the level of risk may be reduced, the level of protection provided by implementing this alternative may not be adequate because the actions presented are educational in nature only. Reliability of this alternative is related to its proper implementation according to the construction project, feedback of which would be included during the five-year reviews.

9.3 Expected Outcomes of Each Alternative

- **NDAI (Alternative 1)** does not provide long-term protection of human health and environment, as it does not reduce potential risk or afford long-term protection. Impacts to the area will remain the same.
- **Fencing and signage with five-year reviews (Alternative 2)** will reduce access and possible receptor interaction, however does not change the status of land use

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within this MRS. Due to the residential and educational use of this area, fencing is not feasible as it would limit access to two residential neighborhoods and a school.

- **Educational awareness with five-year reviews (Alternative 3)** would benefit the local residents by informing them of what contamination could be present, however does not provide a permanent reduction of risk to UXO or MC. Land use would potentially remain the same.
- **Removal of UXO and MC-Contaminated Soil, Explosives Safety Support, Educational Awareness, and Five-year Reviews (Alternative 4)**—Assuming that UXO or DMM and MC-contaminated soil are discovered as a result of the removal activity, there will be a reduction in toxicity, mobility, and volume of UXO, DMM, and MC through their removal. Land use would be considerably changed as areas which were once restricted due to the potential presence of UXO could now be developed if approved by the county. Property owners within the MRS would benefit knowing that their properties would have a reduced risk of UXO and MC hazards. Wetlands in the MRS would be temporarily impacted as they would be cleared of all underbrush in preparation for the removal action. This action, however, could result in a benefit to the wetland and ecology as the clearance would result in thinning underbrush that has been artificially protected from naturally-occurring fires.
- **Removal of UXO and MC-Contaminated Soil in Upland Areas, Fencing and Signage around Wetlands, Explosives Safety Support, and Educational Awareness with Five-year Reviews (Alternative 5)**. Fencing and signage around wetland areas will reduce access and possible receptor interaction, thus reducing the potential for exposure pathway completion and minimizing risk. However, this alternative is not effective in terms of reducing toxicity, mobility, and volume in the wetland areas. Land use would potentially remain the same, as the wetlands would remain undeveloped unless cleared.
- **Explosives Safety Support, Educational Awareness, and Five-year Reviews (Alternative 6)** would benefit developers by informing them of what contamination could be present; however it does not provide a permanent reduction of risk to MEC or MC. This alternative would not be expected to change current or anticipated future land use.

10.0 Comparative Analysis of Alternatives

The rationale for selecting the Preferred Alternatives was based on nine criteria used to evaluate and compare the alternatives. The nine criteria, summarized in Table 2, fall into three

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groups: threshold criteria, primary balancing criteria, and modifying criteria. A description and purpose of the three groups follows:

- Threshold criteria are requirements that each alternative must meet in order to be eligible for selection.
- Primary balancing criteria are used to weigh major trade-offs among alternatives.
- Modifying criteria may be considered to the extent that information is available during the Feasibility Study, but can only be fully considered after public comment is received on the Proposed Plan. In the final balancing of trade-offs among alternatives upon which the final remedy selection is based, modifying criteria are of equal importance to the balancing criteria.

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Table 2
EVALUATION CRITERIA FOR SUPERFUND REMEDIAL ALTERNATIVES

Criteria	Threshold	Overall Protectiveness of Human Health and the Environment determines whether an alternative eliminates, reduces, or controls threats to public health and the environment through institutional controls, engineering controls, or treatment.
		Compliance with applicable or relevant and appropriate requirements (ARARs) and issues to be considered evaluates whether the alternative meets Federal and State environmental statutes, regulations, and other requirements that pertain to the site, or whether a waiver is justified.
	Primary Balancing	Long-term Effectiveness and Permanence considers the ability of an alternative to maintain protection of human health and the environment over time.
		Reduction of Toxicity, Mobility, or Volume of Contaminants through Treatment evaluates an alternative's use of treatment to reduce the harmful effects of principal contaminants, their ability to move in the environment, and the amount of contamination present.
		Short-term Effectiveness considers the length of time needed to implement an alternative and the risks the alternative poses to workers, residents, and the environment during implementation.
		Implementability considers the technical and administrative feasibility of implementing the alternative, including factors such as the relative availability of goods and services.
		Cost includes estimated capital and annual operations and maintenance costs, as well as present worth cost. Present worth cost is the total cost of an alternative over time in terms of today's dollar value. Cost estimates are expected to be accurate within a range of +50 to -30 percent.
	Modifying	State/Support Agency Acceptance considers whether the State agrees with the analyses and recommendations, as described in the RI/FS and Proposed Plan.
		Community Acceptance considers whether the local community agrees with analyses and preferred alternative. Comments received on the Proposed Plan are an important indicator of community acceptance.

Table 3 presents an evaluation of the alternatives based upon the nine criteria presented above.

Table 3: Evaluation of Remedial Alternatives, Pinecastle Jeep Range, Orange County, Florida

Criteria	No Department of Defense Action Indicated (NDAI)	Fencing and Signage with Five-Year Reviews	Educational Awareness with Five-Year Reviews	Removal of MEC and MC-Contaminated Soil, Explosives Safety Support, Educational Awareness, and Five-Year Reviews	Removal of MEC and MC-Contaminated Soil in Upland Areas, Fencing and Signage around Wetlands, Explosives Safety Support, and Educational Awareness with Five-Year Reviews	Explosives Safety Support and Educational Awareness with Five-Year Reviews
	Alternative 1	Alternative 2 - Only Applicable to the Demonstration Range (South) MRS	Alternative 3	Alternative 4	Alternative 5	Alternative 6
Protectiveness	Least protective alternative. No source reduction. No reduction of future risk.	No source reduction. Fencing and signs can reduce interaction with UXO, thus reducing risk. Possible to bypass restrictions.	No source reduction. Hazard recognition to reduce chances of exposure. Public outreach may not reach all persons. Exposure possible.	Remediation of MEC (significant source reduction). Provides protectiveness through educational awareness.	Remediation of MEC (significant source reduction) in upland areas only. Fencing and signage to reduce interaction in wetland areas. Provides protectiveness through educational awareness.	Provides protectiveness through educational awareness.
ARAR/TBC Compliance	No ARARs associated with the alternative.	Need to avoid gopher tortoises and American alligators. May result in destruction or adverse modification of critical habitat.	No ARARs associated with the alternative.	Need to avoid gopher tortoises and American alligators. May result in destruction or adverse modification of critical habitat.	Need to avoid gopher tortoises and American alligators. May result in destruction or adverse modification of critical habitat.	Need to avoid gopher tortoises and American alligators. May result in destruction or adverse modification of critical habitat.
Effectiveness and Permanence	No MEC-related risk reduction and no long-term effectiveness.	No reduction of MEC hazards, but can be effective at reducing possible receptor interaction. Access controls must be reviewed and updated/revised over time.	No reduction of MEC hazards but can be effective at behavior modification and appropriate response.	Can be effective because of hazard reduction and reduced receptor interaction due to education of hazards.	Reduction of MEC in upland areas. Reduced receptor interaction in wetland areas. Results permanent in select areas only.	Effective at reducing receptor interaction with MEC. Limited MEC reduction. Results permanent in select areas only.
Reduction of Toxicity, Mobility, or Volume	No reduction of source.	No reduction of source.	No reduction of source.	Significant reduction in source. MEC hazards are removed from the site.	Reduction in source only in upland areas. Does not affect entire site.	Reduction in source only at work area. Does not affect entire site.
Short-term Effectiveness	No short-term impacts on workers or community.	Possible short-term impacts associated with fence installation.	No short-term impacts associated with distribution of information.	Education reduces receptor interaction.	Possible short-term impacts associated with fence installation.	Education reduces receptor interaction.
Implementability	Readily implemented. No action required.	Signs and fences can be installed for specific areas. Local opposition to conspicuous signs and fences.	Outreach program already in place. Updates and maintenance are implementable.	Similar operations were conducted during the TCRA and RI. Implementable.	Similar operations were conducted during the TCRA and RI. Implementable.	Requires qualified technicians with specialized (but readily available) equipment.
Cost	\$0	\$1,334,791 for Demonstration Range (South) MRS	\$1,375,248 (Same for all 3 Demonstration Range MRSs)	Demonstration Range (North) MRS = \$4,237,012 Demonstration Range (South) MRS = \$15,092,065 Demonstration Range (East) MRS = \$22,468,716	Demonstration Range (North) MRS = \$2,475,229 Demonstration Range (South) MRS = \$9,419,071 Demonstration Range (East) MRS = \$7,464,060	\$1,375,248 (Same for all 3 Demonstration Range MRSs)
	No cost.	Comparatively little cost associated with the amount of fencing needed (7250 ft) annual maintenance, and replacement every seven years, up to 30 years.	Comparatively little cost associated with development and dissemination of education materials for 30 years.	Costs high but justifiable for locations with significant MEC hazards. Costs developed for 30 years.	Costs high but justifiable for locations with significant MEC hazards. Costs developed for 30 years.	Comparably moderate cost but justifiable for locations with low-risk MEC hazards. Costs developed for 30 years.

Note: Shaded box indicates the most practicable solutions for each criteria.

11.0 Principal UXO/MC Issues

11.1. The Demonstration Range (East) MRS has an estimated UXO density of 0.03 UXO/acre and has the risk of human interaction due to the potential for construction activity during future development. During the clearance of 74 acres at the Beltway Commerce Center along Lee Vista Blvd., UXO were encountered in the form of one 40mm HE projectile, two 5" HE HVARs, and two 20mm HE projectiles. The intrusive investigation of geophysical anomalies at the Orange County Solid Waste Management Facility Southern Expansion area encountered one 40mm HE projectile. The RI did not encounter any UXO although one 40mm projectile was detonated and subsequently determined to be inert.

11.2. Aside from containing an explosive hazard, buried UXO acts as a contamination source by presenting the potential for MC to leach from the UXO into the surrounding soil and groundwater. To remove this potential for leaching, only those alternatives which remove the UXO from the site would reduce the toxicity, mobility, and volume of MC. Of the six alternatives presented above, the following would provide for the removal of UXO, thereby eliminating the source of MC:

- Alternative 4—Removal of UXO and MC-Contaminated Soil, Explosives Safety Support, Educational Awareness, and Five-year Reviews; or
- Alternative 5— Removal of UXO and MC-Contaminated Soil in Upland Areas, Fencing and Signage around Wetlands, Educational Awareness with Five-year Reviews, Explosives Safety Support.

11.3. Alternative 6, would result in removal of the source in only those areas where UXO is identified while explosives safety support is provided.

12.0 Selected Remedy

12.1 Summary of the Rationale for the Selected Remedy

The selected remedy is appropriate for the Demonstration Range (East) MRS because of the low UXO density and the current and expected future commercial and industrial land use. This remedy includes provision of education materials to support privately-funded explosives safety support during construction activities at the MRS. Encouraging local contractors and developers to procure UXO-qualified personnel for explosives safety support during excavation activities could be a tool which ensures local governments that encountered UXO are identified and dealt with properly. Assuming that UXO and MC-contaminated soil are discovered as a result of explosives safety support, there will be a reduction in toxicity, mobility, and volume of UXO and MC through their removal. This alternative includes an educational awareness program that provides to residents and local workers information on the UXO and MC hazards and the appropriate response if UXO is encountered. These preventive measures could include

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educational fact sheets that have the goal of modifying behavior to reduce the risk of exposure and reduce the impact if exposure occurs. In addition, letters and fact sheets would be sent to landowners and a website containing educational information would be maintained. Five-year reviews would be conducted to determine if the response action continues to minimize explosives safety risks and continues to be protective of human health, safety, and the environment. Five-year reviews would be conducted to determine if the response action continues to minimize explosives safety risks and continues to be protective of human health, safety, and the environment. The selected remedy is likely to be acceptable to the regulators and the community because it is protective of human health and the environment.

12.2 Detailed Description of the Selected Remedy

12.2.1. Alternative 6 uses a combination of activities to achieve a reduction in the UXO and MC hazard and also minimizes receptor interaction. The activities consist of recommending explosives safety support, promoting educational awareness, and conducting five-year reviews.

12.2.2. Explosives safety support would be implemented in the form of one or more UXO-qualified technicians hired by the contractor conducting the excavation activities. The UXO-qualified technician(s) would be available to brief the contractor, management, or construction team on the probable site hazards, procedures when UXO are encountered, responsibilities and lines of authority for MEC response, and emergency response procedures. This technician either could be present onsite at the point of excavation for the duration of the ground-breaking activities or could also serve on a “on call” basis. Examples of ground-breaking activities would include surveying, installation or maintenance of underground utilities, and installation of fence posts. The USACE will not be providing onsite UXO technicians but will provide explosives safety education materials.

12.2.3. As part of this alternative, an educational awareness program would be implemented and would consist of development of educational tools and materials and continuation of the outreach campaign that the USACE conducted during the TCRA and RI projects. Reports, fact sheets, and other information would also be posted to the project website maintained by the USACE. Materials will be prepared by the USACE for distribution by the local governments to contractors seeking permits. Five-year reviews would also be conducted to determine if the response action continues to minimize explosives safety risks and continues to be protective of human health, safety, and the environment.

12.3 Cost Estimate for the Selected Remedy

The information in the cost estimate summary table below is based on the best available information regarding the anticipated scope of the remedial alternative. Changes in the cost element are likely to accrue as a result of new information. Major changes may be documented in the form of a memorandum in the Administrative Record file, or a Decision Document

amendment. This is an order-of-magnitude cost estimate that is expected to be within +50 to -30 percent of the actual project cost.

Table 3
Cost Estimate for Demonstration Range (East) MRS

Alternative 6 – Demonstration Range (East)	
<i>Education (over 30 years)</i>	<i>\$1,068,150</i>
<i>Five-year Reviews (over 30 years)</i>	<i>\$307,098</i>
Total Cost Alternative 6 – Demonstration Range (East)	\$1,375,248

12.4 Estimated Outcomes of Selected Remedy

The land comprising the Demonstration Range (East) MRS, as it currently stands, contains several warehouses and is undergoing development for other commercial and industrial uses. The Orange County Solid Waste Management Facility also employs workers who work within the part of the landfill within this MRS. Future land use for this MRS is expected to consist of additional commercial development and expansion of the landfill. Groundwater is currently not used within this MRS and this is not expected to change in the future. Environmental impacts are expected to be less significant when compared to the other Demonstration Range MRSs since removal action activities are not likely to occur within the wetlands and significant clearing of underbrush is not expected to occur. The selected remedy is expected to result in reduced risk to workers at the MRS by education to modify behavior during excavation activities.

13.0 Statutory Determinations

13.1. It is expected that the chosen alternative contains the best remedy for the protection of human health and the environment from UXO and MC contamination. For areas where a UXO hazard exists but at a lower risk level, such as the Demonstration Range (East) MRS, recommending explosives safety support and educational awareness is appropriate in lieu of a remedial action to remove UXO. This alternative will reduce the UXO risk for onsite construction workers, but it will not completely eliminate risk. There would still be risk since property owners may encounter UXO while conducting intrusive activities. The residual risk associated with potential subsurface UXO outside of the construction area is addressed through the educational awareness program.

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13.2. The chosen alternative complies with ARARs and TBCs listed in Table 4 and currently is not expected to require a waiver. The cost associated with this alternative is reasonable in relation to providing the best outcome for the given amount of money. The solution is permanent in only those areas where UXO is removed during explosives safety support.

13.3. Five-year reviews, as outlined in Section 121(c) of CERCLA, as amended by SARA, and Section 300.430 (f) (ii) of the NCP, will be conducted at the Demonstration Range (East) MRS. Five-year reviews will be conducted to 1) ensure that the remedial actions remain protective of human health, safety, and the environment; and 2) evaluate the implementation and performance of the selected remedy.. Data gathered during the review process will be used to determine if further action needs to be taken to protect public safety and the environment. If no changes have taken place, the site will continue to be monitored at the specified intervals. At the completion of the review, a Five-year Review Report will be prepared, and a public notice will be placed in the local newspaper concerning the continued effectiveness of the remedy.

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Table 4 – Description of ARARs for Selected Remedy

Authority	Requirement	Status	Synopsis of Requirement	Action to be Taken to Attain Requirement
Federal Regulatory Requirement	40 CFR 264 RCRA subparts I, L, X 40 CFR 262.11	Relevant and Appropriate	Provides requirements for treatment of explosive constituents via an open burning/open detonation unit. This would apply to blow-in-place effort during MEC removal work.	Pre- and post-demolition samples will be collected to ensure MC are not introduced to the environment, or to gauge the amount of MC that is.
Federal Regulatory Requirement	Protection of Wetlands 33 CFR 320 et, seq Executive Order 11988	Applicable	Requires action to minimize loss or degradation of wetlands. Remedial activities must: take steps to avoid or minimize wetland and flood plain impacts.	Brush clearing activities conducted during this removal action will be conducted in a manner which will ultimately benefit the wetlands.
Federal Regulatory Requirement	Endangered Species Act USC Title 16 chapter 35§1536 (a)(2)	Applicable	Establishes rules for the protection of federal or state-listed species.	Fieldwork conducted in the habitats of state or protected species (e.g. gopher tortoise or American alligator) will be done so in a manner which minimizes impact to their habitat.
State Regulatory	Florida Administrative Code (Chapter 68A-27, Rule 68A-27.004)			
FDEP Code	Florida Administrative Code 62-777 Contaminant Cleanup Target Levels	TBC	Establishes guidelines for determining cleanup target levels	Cleanup target levels for future actions will be established using this guidance.

14.0 Documentation of Significant Changes from Preferred Alternative of Proposed Plan

Alternative 6 was selected for the Demonstration Range (East) MRS as presented in the final Feasibility Study and Proposed Plan. One change for this alternative is the removal of the requirement for construction support to be funded and provided directly by the USACE. Providing construction support for remedial actions is contrary to current USACE FUDS policy. Even with the removal of USACE-provided construction support Alternative 6 is still protective and is the best overall remedy.

PART 3: THE RESPONSIVENESS SUMMARY

1.0 Stakeholder Issues and Lead Agency Responses

Part II Section 3.0 of this Decision Document described the activities used to solicit community input. A public meeting was held on July 22, 2010 to present the Proposed Plan and obtain comments from the community. The meeting also initiated a 30-day public review period. Members of the public made comments during the meeting and written comments were received during the review period. Letters, along with a Proposed Plan fact sheet, were sent to all of the property owners within the former Range to invite them to the meeting, to explain the recommended alternatives and to encourage them to submit comments. A summary of the concerns raised by the public and stakeholders along with responses are provided below.

Concern: A resident expressed concern over the omission of the discussion regarding munitions debris found in the portion of the Warwick development which is within the Remaining Area MRS. There was concern that the presence of munitions debris in that area constitutes a hazard to the public, and for this reason, the area should be included in one of the Demonstration Range MRSSs.

Response: The Warwick development was intrusively investigated to the fullest extent possible to 100% of the exposed ground surface (the eastern half by the USACE and the western half by the developer), and no hazardous munitions were found. The munitions debris consisted of two non-explosively configured bombs and brass casings from .50 caliber bullets. The bombs were likely from educational displays that were shown to military personnel participating in the training exercises conducted during World War II. The brass casings can be attributed to waste from the machine gun range farther east. The munitions debris does not constitute an explosive hazard. Warwick is outside of the property controlled by the military during World War II and behind the observation areas. Given the extensive investigation and the historical use of the site, it is unlikely that munitions would be found in Warwick. The recommendation for Warwick to be included in the Remaining Area MRS, as presented in the Proposed Plan, is based on this consistency of data.

Concern: The residential areas within the FUDS boundary (namely Avon, Tivoli Woods, Central Park, and parts of Newport) were partly within a former .50 caliber machine gun range. Also, samples collected during the Site Inspection within a wetland in this area contained mercury above background levels (as stated in the Site Inspection Report). For these reasons, the residential areas should be included in the portion of the site requiring further action.

Response: The extensive investigation of the residential areas as part of the Remedial Investigation did not find any hazardous munitions in the areas north of Lee Vista Blvd. The limited number of expended .50 caliber bullets do not constitute a hazard. The screening level

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risk assessment in the Site Inspection Report found that the mercury detection (0.2 mg/kg) did not exceed the Florida Department of Environmental Protection (FDEP) Direct Contact criteria (3 mg/kg) nor the FDEP leachability criteria (2.1 mg/kg). Soil samples were also collected during the Remedial Investigation but again did not exceed the FDEP screening levels. A review of the list of munitions used at Pinecastle Jeep Range shows that mercury is only a very minor component of some of the munitions used at the site, indicating that the small quantities of mercury identified in the soil is likely naturally occurring or due to some source other than military munitions. Based on this information, which has also been included in the Remedial Investigation Report, there is no strong basis for including the residential areas north of Lee Vista Boulevard, with the areas requiring further action.

Concern: An explanation for the time frame of two to six years for the removal operation under Alternative 4 should be provided and alternatives explored for shortening the time frame for this action.

Response: The USACE considers these actions to be high priority (based on prioritization scoring) and will seek to expedite the schedule appropriately. The two to six year estimates for conducting removal responses in the Proposed Plan are based on past experience with such operations at other sites.

Concern: Special attention and assistance is being provided to developers and builders in the area.

Response: The USACE's first priority in scheduling additional work at Pinecastle will be in the Demonstration Range (North) MRS where there are residential homes and a middle school. The concern about special assistance to developers could be based on a misunderstanding of "construction support" and how and when it will be provided. On-site construction support with an unexploded ordnance technician will probably be limited to local governments with infrastructure projects in special circumstances. The USACE may provide educational materials to developers and other entities conducting excavation projects within the Demonstration Ranges, but developers will need to fund their own UXO technicians to monitor activities that penetrate the ground surface.

Concern: Groundwater and soil testing was only conducted where munitions were encountered, that the final RI/FS Report did not recommend any additional groundwater or soil testing.

Response: The Remedial Investigation used a standard approach to environmental investigations that determines if contamination is moving from sources of contamination (in this case munitions and munitions debris) into underlying soils and groundwater. Our sampling was focused on locations where munitions were found. Results indicated concentrations that exceeded the FDEP criteria at only limited locations. Additional samples

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were collected surrounding the locations with FDEP exceedances to bound the areas of contamination. At the request of FDEP, monitoring wells were installed and sampled but no further exceedances were found. Overall, elevated concentrations were found at very limited locations, and were mostly attributed to munitions demolitions that occurred during the investigation. The remedial investigation did not find widespread contamination in the soil and did not find contamination in the groundwater. For this reason, no widespread groundwater and soil sampling was recommended.

Concern: The Orange County Solid Waste Division recommended that the Demonstration Range (East) MRS be extended south to the Beachline Expressway so that all of the future landfill expansion in that area would be within the area being recommended for Construction Support. It was also requested that the USACE plan sufficient funding to provide Construction Support for the future landfill projects in that area.

Response: The boundary of the Demonstration Range (East) MRS should not be moved without supporting information that munitions hazards exist outside the current boundary. The RI field data do not support moving the boundary.

Concern: Orange County also recommended Permit Restrictions (which at a minimum could consist of a notice and disclaimer) stating that the area was part of the former Pinecastle Jeep Range. The county also indicated that it is evaluating the issue of requiring additional geotechnical analysis for parcels within the Remaining Area MRS, notwithstanding the findings and recommendations of the RI/FS.

Response: The recommended alternatives outlined in the Proposed Plan as finalized by the Decision Document constitute the USACE's recommendations for this site. The county is free to impose any additional requirements at its discretion.

Concern: During the public meeting, a few residents inquired as to whether the Pinecastle Jeep Range would ever be 100% clear of munitions. Residents were also curious as to USACE's stance in the event that, years from now, munitions are discovered within the areas which were cleared, or those that were cleared as a result of the recommended future removal actions.

Response: Due to technological limitations, it is impossible to guarantee that all munitions are removed—or could be removed—from the former Pinecastle Jeep Range. If, in the future, munitions are discovered within areas which were already cleared, the public should practice the "Three R's" of UXO safety (Recognize the item may be a munition, Retreat from the location, and Report the location to the proper authorities). The local authorities may report the incident to the USACE, who will then determine whether follow-on actions are needed.

Concern: The FDEP review of the draft final Remedial Investigation/Feasibility Study Report expressed concerns about munitions constituents (mainly copper, barium, and some

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explosives compounds) concentrations in soil exceeding either the FDEP Direct Contact criteria or Leachability to Groundwater criteria at several isolated locations within the Demonstration Range MRSs where demolition activities destroyed munitions during the RI.

Response: Additional soil samples were collected to help determine the extent of the exceedances, and groundwater wells were installed at four of the six recommended locations where leachability criteria were exceeded (one location was inaccessible and another was flooded). Subsequent soil sampling demonstrated that munitions constituents were limited to small footprints (~1 square meter) on the surface, and that munitions constituents were not leaching into the shallow groundwater. Results from this additional sampling were incorporated into the final Remedial Investigation report.

2.0 Technical and Legal Issues

Current policy within the USACE does not allow for the provision of funding for construction support as part of the remedial alternatives for the former Pinecastle Jeep Range. Instead, onsite monitoring and technical support by UXO technicians may still be provided and funded by landowners and contractors performing activities within affected areas which may increase the probability of contact with UXO or DMM, but the USACE does not have the authority to impose this as a requirement.

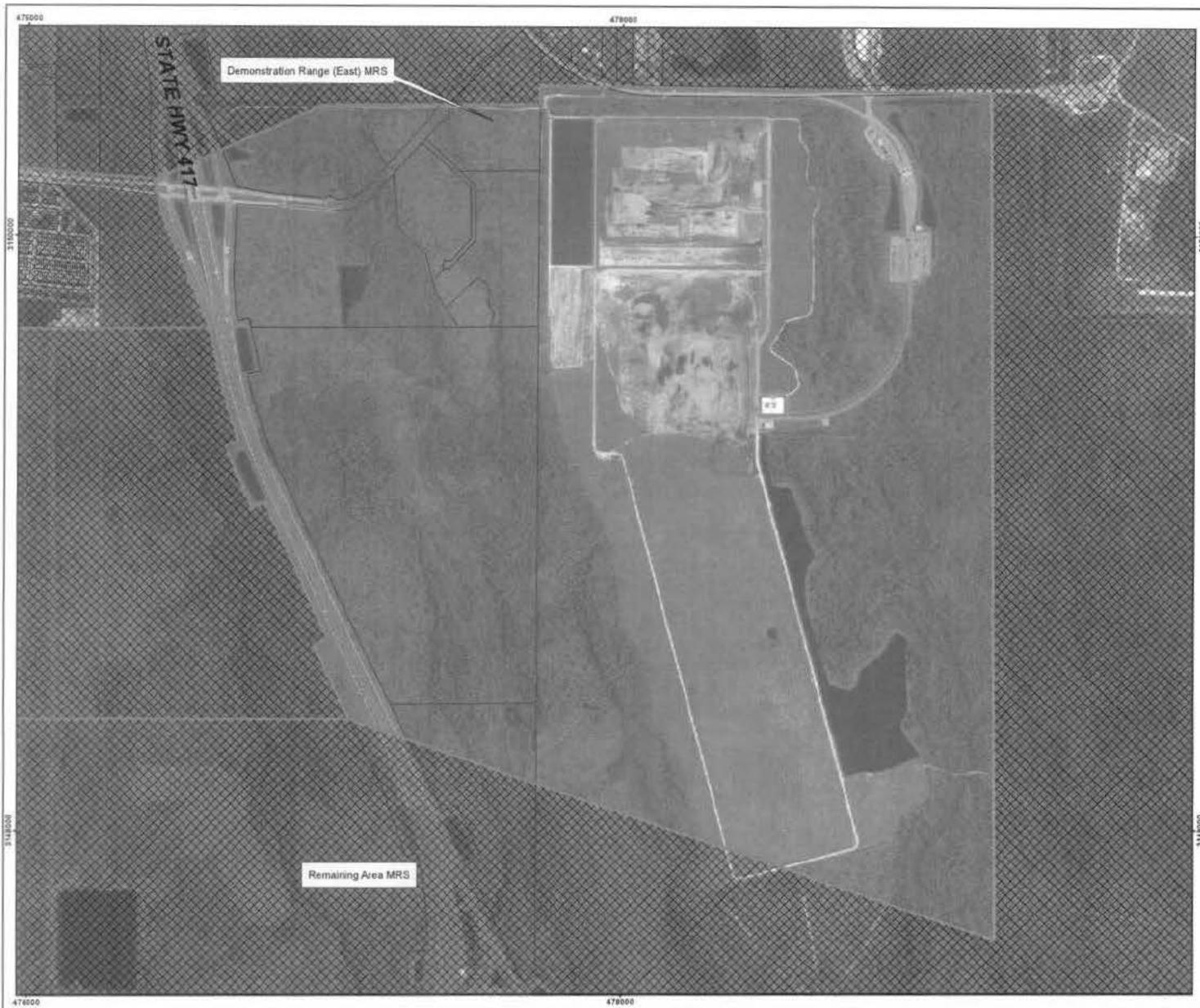


Figure 1

Demonstration Range (East) MRS
Pinecastle Jeep Range
 Orange County
 Orlando, Florida

Legend

- MRS Boundary
- ▬ FJDS Boundary
- Parcel Boundary



Image Source: 2007 Orthophotos
 Projection: UTM Zone 17 NAD83. Units in Meters

400 200 0 400 Meters

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PARSONS		U.S. ARMY CORPS OF ENGINEERS HUNTSVILLE CENTER	
DESIGNED BY BT	Pinecastle Jeep Range		
DRAWN BY BT			
CHECKED BY GH	SCALE As Shown	PROJECT NUMBER 746163.03004	
SUBMITTED BY MS	DATE November 2010	PAGE NUMBER	
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Figure 2 - CONCEPTUAL SITE EXPOSURE MODEL

Site/MRS Name: FORMER PINECASTLE JEEP RANGE – Demonstration Range (East) MRS

Completed By: Steve Rembish, PARSONS

Date Completed: Sept. 14, 2009

