

FINAL

**MILITARY MUNITIONS RESPONSE PROGRAM
FORMERLY USED DEFENSE SITES PROGRAM**

DECISION DOCUMENT

**BUCKROE BEACH
HAMPTON, VIRGINIA**

FUDS PROPERTY NO. C03VA1011



**U.S. ARMY CORPS OF ENGINEERS
BALTIMORE DISTRICT
10 SOUTH HOWARD STREET
BALTIMORE, MARYLAND 21201**

September 2015

TABLE OF CONTENTS

Section	Page
1.0 DECLARATION.....	1-1
1.1 SITE NAME AND LOCATION.....	1-1
1.2 STATEMENT OF BASIS AND PURPOSE.....	1-1
1.3 ASSESSMENT OF THE SITE.....	1-1
1.4 DESCRIPTION OF SELECTED REMEDY.....	1-1
1.5 STATUTORY DETERMINATIONS.....	1-1
1.6 AUTHORIZING SIGNATURE.....	1-2
2.0 DECISION SUMMARY.....	2-1
2.1 SITE NAME, LOCATION, AND DESCRIPTION.....	2-1
2.2 SITE HISTORY AND ENFORCEMENT ACTIVITIES.....	2-3
2.3 PREVIOUS REMOVAL AND REMEDIAL ACTIONS.....	2-4
2.4 OUTREACH AND COMMUNITY PARTICIPATION.....	2-5
2.5 SCOPE AND ROLE OF RESPONSE ACTION.....	2-7
2.6 SITE CHARACTERISTICS.....	2-7
2.7 CURRENT AND POTENTIAL FUTURE LAND AND RESOURCE USES.....	2-10
2.8 SUMMARY OF SITE HAZARDS AND RISKS.....	2-10
2.8.1 Risk Evaluation for Munitions.....	2-10
2.8.2 Human Health Risk Evaluation.....	2-15
2.8.3 Ecological Risk Evaluation.....	2-15
2.9 REMEDIAL ACTION OBJECTIVES.....	2-15
2.10 DESCRIPTION OF ALTERNATIVES.....	2-16
2.10.1 Alternative 1.....	2-16
2.10.2 Alternative 2.....	2-16
2.11 SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES.....	2-17
2.11.1 Overall Protectiveness of Human Health and the Environment.....	2-17
2.11.2 Compliance with Applicable or Relevant and Appropriate Requirements (ARARs) and To Be Considered Criteria (TBCs).....	2-17
2.11.3 Long-Term Effectiveness and Permanence.....	2-17
2.11.4 Reduction of Toxicity, Mobility, or Volume (TMV) of Contaminants Through Treatment.....	2-17
2.11.5 Short-Term Effectiveness.....	2-18
2.11.6 Implementability.....	2-18
2.11.7 Cost.....	2-18
2.11.8 State Acceptance.....	2-18
2.11.9 Community Acceptance.....	2-18
2.12 PRINCIPAL THREAT WASTES.....	2-18
2.13 SELECTED REMEDY.....	2-19
2.14 STATUTORY DETERMINATIONS.....	2-19
2.14.1 Protection of Human Health and the Environment.....	2-19
2.14.2 Compliance with Applicable or Relevant and Appropriate Requirements.....	2-20
2.14.3 Cost-Effectiveness.....	2-20
2.14.4 Utilization of Permanent Solutions and Alternative Treatment (or Resource Recovery) Technologies to the Maximum Extent Practicable.....	2-20
2.14.5 Preference For Treatment as a Principal Element.....	2-20

2.14.6	Five –Year Review Requirements.....	2-20
2.15	DOCUMENTATION OF SIGNIFICANT CHANGES	2-21
3.0	RESPONSIVENESS SUMMARY	3-1
4.0	REFERENCES	4-1

LIST OF TABLES

<i>Table</i>	<i>Page</i>
Table 2-1: Munitions Severity Categories.....	2-11
Table 2-2: Munitions Sensitivity.....	2-12

LIST OF FIGURES

<i>Figure</i>	<i>Page</i>
Figure 2-1: Buckroe Beach Site Location.....	2-2
Figure 2-2: Buckroe Beach Zoning Map.....	2-9
Figure 2-3: Buckroe Beach Land Use Planning Map.....	2-13

LIST OF APPENDICES

Appendix

A	Public Meeting Summary
---	------------------------

LIST OF ACRONYMS AND ABBREVIATIONS

CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CSM	Conceptual Site Model
DD	Decision Document
DERP	Defense Environmental Restoration Program
DMM	Discarded Military Munitions
DGM	Digital Geophysical Mapping
DoD	Department of Defense
FS	Feasibility Study
FFS	Focused Feasibility Study
FUDS	Formerly Used Defense Site
LUC	Land Use Control
LUCIP	Land Use Control Implementation Plan
Mag-and-dig	magnetometer or magnetometer sweep, followed by excavation
MD	Munitions Debris
MC	Munitions Constituents
MEC	Munitions and Explosives of Concern
MMRP	Military Munitions Response Program
MRS	Munitions Response Site
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
RI	Remedial Investigation
SVOC	Semi-volatile Organic Compound
TCRA	Time Critical Removal Action
USACE	U.S. Army Corps of Engineers
USACE-Baltimore	U.S. Army Corps of Engineers, Baltimore District
USACE-Huntsville	U.S. Army Corps of Engineers, Norfolk District
USACE-Norfolk	U.S. Army Corps of Engineers, Huntsville Division
USACE-Omaha	U.S. Army Corps of Engineers, Omaha District
USEPA	U.S. Environmental Protection Agency Region III
UU/UE	Unlimited Use and Unrestricted Exposure
UXO	Unexploded Ordnance
VDEQ	Virginia Department of Environmental Quality

1.0 DECLARATION

1.1 SITE NAME AND LOCATION

The site is Buckroe Beach in Hampton, Virginia, listed in the Formerly Used Defense Sites (FUDS) Program as Property No. C03VA1011. It is being addressed under the Military Munitions Response Program (MMRP) as Munitions Response Site (MRS) CO3VA101101. Buckroe Beach is not a site on the National Priorities List (NPL) or the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS).

1.2 STATEMENT OF BASIS AND PURPOSE

The purpose of this Decision Document is to present the Final Decision for the Buckroe Beach Munitions Response Site. This Final Decision was chosen under the Defense Environmental Restoration Program (DERP) and in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act (SARA), and, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). Supporting documents pertaining to the Buckroe Beach site are provided in the Administrative Record located at the Hampton Library, 1 Mallory Street, Hampton, Virginia.

This Decision Document is issued by the U.S. Army Corps of Engineers (USACE) as the U.S. Department of Defense's lead agency for the FUDS program. The Virginia Department of Environmental Quality (VDEQ), in consultation with the U.S. Environmental Protection Agency Region III (USEPA), as the regulatory supporting agency, concurs with the final decision. This decision was coordinated with the City of Hampton, Virginia, which has agreed to execute the selected remedy.

1.3 ASSESSMENT OF THE SITE

The response action selected in this Decision Document is protective of public health and welfare or the environment from explosive safety hazards associated with the potential existence of military munitions on Buckroe Beach.

1.4 DESCRIPTION OF SELECTED REMEDY

The USACE has determined that land use controls (LUCs), including public notification and education measures, are necessary to protect human health, safety, and the environment for Buckroe Beach.

1.5 STATUTORY DETERMINATIONS

The Remedial Investigation Report (USACE 2009) assessed the nature and extent of Munitions and Explosives of Concern (MEC) and Munitions Constituents (MC) at Buckroe Beach. No unacceptable risks to human health and the environment due to MC were identified. However, MEC may potentially move to the surface due to erosion or migration during storm events and pose a low probability hazard. 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 utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable. The five earlier geophysical investigations and removals identified, removed and treated/destroyed found MEC items, and those that are encountered in the future will also be removed for treatment or destruction. Because this remedy will result in hazards remaining on-site above levels that allow for unlimited use and unrestricted exposure (UU/UE), five-year reviews will be conducted as long as hazards remain above UU/UE.

1.6 AUTHORIZING SIGNATURE



Edward P. Chamberlayne, P.E.
Colonel, U.S. Army
Commander and District Engineer

23 Oct 15

Date

2.0 DECISION SUMMARY

The U.S. Army Corps of Engineers (USACE) has prepared this Decision Document (DD) for the Army as the lead agency for the FUDS program. Eligibility for the FUDS program is generally restricted to property that was historically owned or leased by the Department of Defense (DoD). Although Buckroe Beach is privately owned, the ordnance items found at Buckroe Beach were determined to be of DoD origin, and hence the environmental response was placed under the FUDS program (USACE, 1990). The remedial action has been selected in accordance with the requirements of the Defense Environmental Restoration Program (DoD, 2012; HQDA, 2007), CERCLA/Superfund Amendments and Reauthorization Act, the NCP, the DoD Military Munitions Response Program (MMRP), and the USACE FUDS Program Policy (USACE, 2004).

2.1 SITE NAME, LOCATION, AND DESCRIPTION

The site is listed in the FUDS as Property No. C03VA1011 and in the MMRP as MRS CO3VA101101.

Buckroe Beach is located on the western shore of the Chesapeake Bay approximately 3 miles north from the mouth of the James River and Fort Monroe (see Figure 2-1). The geographic coordinates for the location of Buckroe Beach are at latitude 37° 2' 20" and longitude 76° 17' 30". The actual beachfront consists of just less than 1 mile of sandy beach. In addition to the beachfront there is private housing, a concrete "boardwalk" and a community park with restroom facilities, parking and two picnic shelters. A seawall separates the sand beach from the developed park and private housing. Along the beach there are eight stone groins, a breakwater, and an observation pier.

Buckroe Beach is located within the downtown section of the City of Hampton, Virginia, which is an independent city of the Commonwealth of Virginia. The majority of the land use within the City of Hampton is residential; however the city center is mostly commercial businesses. Neighboring communities around Hampton are Newport News, Norfolk, and Portsmouth, Virginia, collectively known as Hampton Roads. The City of Hampton has grown approximately 10 percent in population during the last decade. The Hampton Roads area is the 27th largest metropolitan area in the United States with more than 1.5 million people.

The City of Hampton is heavily dependent on military installations and defense-related industry, particularly shipbuilding. Approximately 12 percent of the total employment in Hampton is military related. There are eleven military installations within the Hampton Roads area representing every branch of the armed forces. In recent years, the regional economy has become more diversified with financial, health care, and a growing high-tech sector. Within the Hampton Roads areas, services are now the largest employment sector surpassing the defense industry. As population grows, the urbanization trend within the City of Hampton is increasing.

Buckroe Beach is not listed on the National Priorities List (NPL) or the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS). USACE is the lead agency for the military munitions environmental response, and coordinates the response with the U.S. Environmental Protection Agency (USEPA) and the Virginia Department of Environmental Quality (VDEQ). The response is funded through the FUDS program of the DERP.

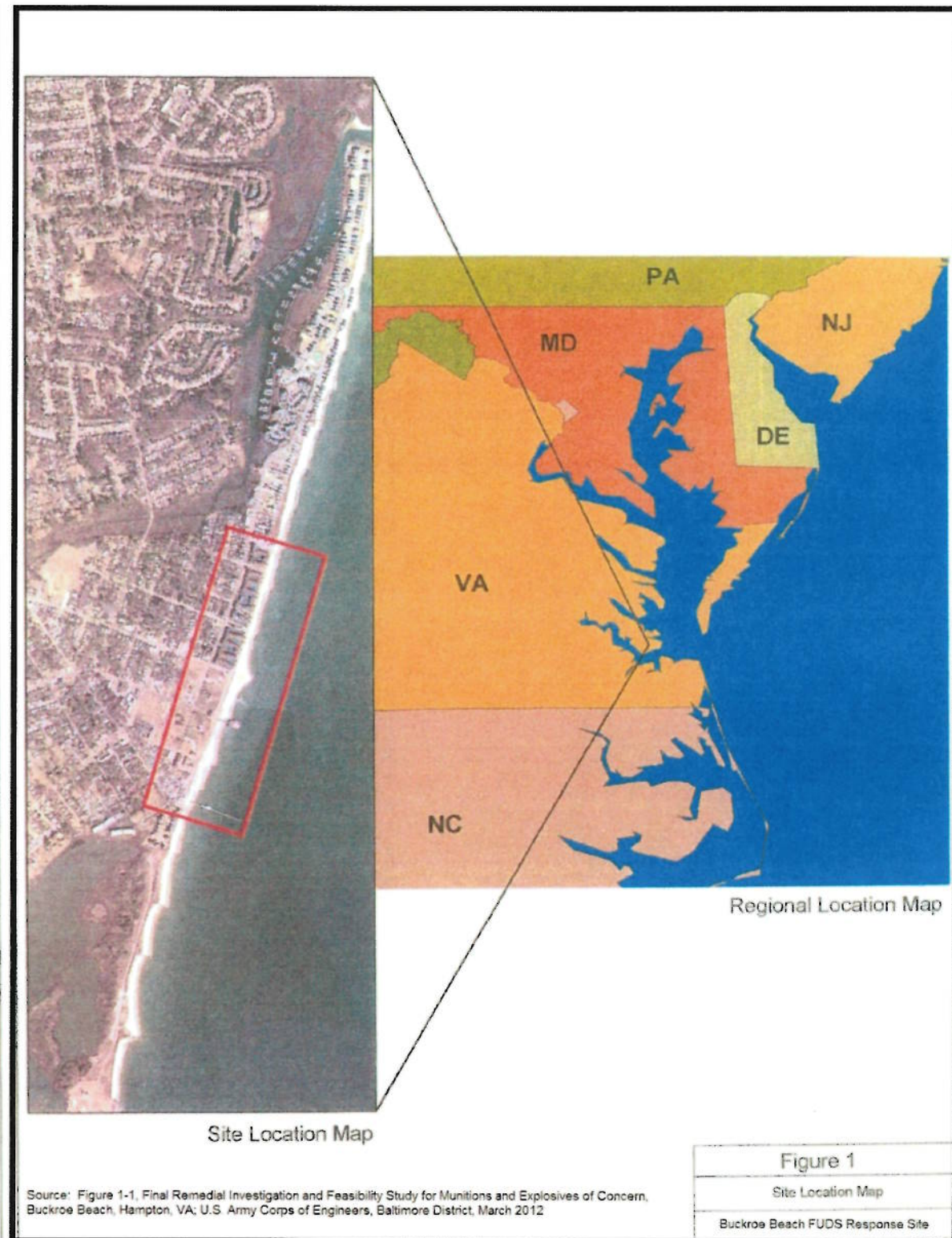


Figure 2-1: Buckroe Beach Site Location

(Source: USACE, 2009)

2.2 SITE HISTORY AND ENFORCEMENT ACTIVITIES

In July and August 1990, the City of Hampton, Virginia, conducted a beach replenishment project at Buckroe Beach, placing approximately 280,000 cubic yards of sand over a 3,700 linear foot section of the beach. There was no Federal funding involved in the 1990 replenishment effort. The sand material was dredged from the borrow area at the bottom of Chesapeake Bay approximately 2 miles offshore to a depth of 8 feet. There was no screening for Munitions and Explosives of Concern (MEC) during the dredging project. The available range fan charts were checked and it appeared the borrow area was outside the impact area of nearby Fort Monroe. Following completion of the 1990 beach replenishment MEC were reported on the beach and removed by local Explosive Ordnance Disposal (EOD) units.

In 1996, the City of Hampton conducted a second beach replenishment project placing approximately 56,500 cubic yards of sand over 1900 linear feet of the beach, coincident with the northern portion of the beach that was losing sand due to erosion and storm events. There was no Federal involvement in the 1996 beach replenishment effort. During the 1996 replenishment effort, the dredged material was screened with a 3-inch rebar grate at the discharge point to prevent MEC items larger than the size of 76-mm projectiles from being placed on the beach. The grate failed during a portion of the replenishment effort and at least one MEC item was later recovered on the beach.

MEC continued to be found on the beach several times a year, especially after storm events. The EOD response to found MEC was coordinated directly between the Hampton Fire Department in Buckroe Beach and Langley Air Force Base (AFB) EOD. Other City offices or USACE were not notified of the MEC finds.

During the May-June 2001 Ordnance and Explosives (OE) Line Item Review (LIR), USACE-Huntsville recommended that Buckroe Beach be programmed for an Engineering Evaluation/Cost Analysis (EE/CA) and assigned a Risk Assessment Code (RAC) score of 3 (moderate level risk). In June 2002, USACE-Huntsville revisited their 2001 recommendation and maintained that an EE/CA be conducted with a RAC score of 3.

In 2001, the City of Hampton Fire Department Haz-Mat Captain reported the MEC incidents at Buckroe Beach to the USEPA Region III. The USEPA notified USACE-Norfolk about the MEC incidents. This was the first time USACE-Norfolk learned of the continued and recent MEC recoveries. Between June and August 2002, USACE-Norfolk participated in multiple teleconferences and meetings with USEPA and the City of Hampton. During this period USACE-Norfolk also researched the available information from Langley AFB EOD, Yorktown Navy EOD, USACE-Huntsville, and the Air Force Information Repository at Tyndall AFB.

Of the various MEC items recovered at Buckroe Beach since 1997, two were reported to be Marine Marker MK-25 flares possibly used by the U.S. Navy. The flares were likely washed up from DoD training exercises found all along the local coast line and determined to not be associated with the beach replenishment activities.

In August 2002, USACE-Norfolk committed to USEPA to verify FUDS eligibility of Buckroe Beach, and sought funding for a response action. The potential for an emergency response by USACE-Omaha District (USACE-Omaha) was discussed, but with limited funds available to cover such a large (26 acres) area to investigate under an emergency response action, it would have been extremely difficult to determine where to focus the emergency response activities. In September 2002, USACE-Norfolk approached USACE-Baltimore District (USACE-Baltimore) to conduct a Time Critical Removal Action (TCRA) along a 3,700 foot section of Buckroe Beach where the 1990 beach replenishment was performed.

2.3 PREVIOUS REMOVAL AND REMEDIAL ACTIONS

After the 1990 beach replenishment project was completed, MEC was reported on the beach, the local EOD unit was notified, and approximately 55 MEC items were removed, consisting mainly of 76-mm projectiles. In November 1990, USACE, North Atlantic Division (NAD) determined that Buckroe Beach was eligible under DERP-FUDS based on the military origin of the MEC. USACE-Huntsville was charged to determine if further action was warranted.

Between 1990 and 1994, USACE-Huntsville conducted an initial removal action of MEC on the beach, and subsequent yearly sweeps of the beach until it appeared to USACE-Huntsville that they were not going to find any additional MEC. The removal effort by USACE-Huntsville detected and removed MEC items to a depth of 24 inches, covering the dry beach, the intertidal zone between the mean high and low tide water, and channel ward to knee deep water at low tide (UXB, 1990; EHS, 1991; UXB, 1992; UXB, 1993).

In March 2003, USACE-Baltimore awarded a Delivery Order to Cape Environmental to conduct a TCRA that discovered and disposed of eleven Munitions Debris items with a handheld magnetometer survey (called a mag and dig operation) on as much of the dry beach as possible, concentrating on the areas heavily used by the public.

In October 2003, USACE-Baltimore awarded a Delivery Order to Weston Solutions to conduct a second TCRA at Buckroe Beach. A total of 579 anomalies identified by the Digital Geophysical Mapping (DGM) and mag-and-dig surveys were excavated (Weston, 2004). Of these 579 excavations, eight 75-mm and 76-mm MEC items were identified as inert filled or expended shrapnel rounds.

In 2004, USACE (Norfolk and Baltimore Districts) performed a soil sample investigation at locations where the remains of explosive-filled ordnance items had been found and removed during the 2003 TCRA (USACE, 2004b). The purpose of this sampling event was to determine the presence or absence of residual contamination in soil as a result of MEC or MEC-related removal activities. Results from this sampling event indicate that no compounds of concern relating to MEC or MEC-related activities are present at Buckroe Beach. Trace metals are present, but at concentrations either below screening criteria or within the range of accepted natural background concentrations.

In September 2009, USACE-Baltimore published a Remedial Investigation/Feasibility Study (RI/FS) (USACE, 2009) for MEC at Buckroe Beach. That effort did not include additional investigation work, but rather its stated purpose was "to present the results gathered from previous Munitions and Explosives of Concern (MEC) removal actions and provide information to determine the nature and extent of any remaining potential risks to human health and the environment." The RI concluded that Buckroe Beach is not a source of MEC/MC needing further investigation. It was determined that a potential exists for MEC in the near-shore areas of Buckroe Beach to be brought ashore during significant weather events. The RI recommended that a Focused Feasibility Study (FFS) be prepared focusing on land use controls. The FFS assessed two alternatives: No Further Action, as required by the NCP, and Land Use Controls (LUCs). LUCs were considered to have three categories:

- Legal and administrative controls, such as zoning and permits,
- Engineering Controls, such as barriers, and signage, and
- Education, such as public meetings, training videos, and brochures.

A third alternative, remediation to achieve Unlimited Use / Unrestricted Exposure (UU/UE), was not evaluated within the FFS, and will not be evaluated in this document or subsequent documents, due to the dynamic environment of the beach, ocean, and weather. The excavation, sifting, and replacement of 26 acres of beach sand would not prevent the possibility of MEC in the tidal surf zone that may

potentially move to the surface as a result of erosion or migration from wave action and ocean currents, especially during storm events.

The alternatives were compared using the nine criteria specified in the NCP. The LUC alternative was found to satisfy the nine criteria as follows:

1. Overall Protection of Human Health and the Environment will be met by posting signs warning of the possibility of encountering munitions and actions to take if an MEC item is discovered, and by furnishing educational materials and safety training videos to make the public aware of necessary actions to take in the event of a MEC discovery.
2. Compliance with Applicable or Relevant and Appropriate Requirements (ARARs) was met because no ARARs have been identified specific to MEC.
3. Long-term Effectiveness and Permanence is achieved by educational efforts and public outreach.
4. Reduction of Toxicity, Mobility, or Volume through Treatment has been achieved through the five geophysical investigations and removals of any found MEC items from 1990 through 2004. The LUC remedy itself does not further treat any MEC, however it helps ensure that any encounters with MEC in the future will be reported to the DoD, which will remove and/or treat/destroy the MEC item.
5. Short-term Effectiveness is achieved because there is no major field activity associated with implementing the LUCs that would cause adverse impacts to personnel or the environment.
6. Implementability USACE has the knowledge to create educational materials and distribute them.
7. Cost is estimated at \$100,000 total cost every five years that includes the LUCIP, signage, and educational materials of a safety training video, brochures and fact sheets. The FFS underestimated the costs for controls. The materials did not contain the administrative or managerial effort for design and procurement. USACE will provide the signs and educational outreach materials to the City of Hampton.
8. State Acceptance was achieved through coordination with the VDEQ during the removal actions, preparation of the RI/FS, and community availability of the Proposed Plan. The VDEQ has concurred with the proposed LUC action.
9. Community Acceptance was achieved through coordination with the City of Hampton and the Buckroe Beach Civic Association.

2.4 OUTREACH AND COMMUNITY PARTICIPATION

Throughout the removal action and RI/FS process for Buckroe Beach, the plans and results of these activities were presented to stakeholders and community members through periodic public outreach and community participation activities. Activities included:

- An information repository was established at the Hampton Library to make documents associated with the project available to the public.
- In the fall of 2002, USACE-Norfolk assembled an interagency project team to address ordnance issues at Buckroe Beach. USACE worked closely with the City of Hampton, USEPA, and the VDEQ to coordinate public communication efforts and enhance safety at Buckroe Beach.
- The team began public involvement efforts at Buckroe Beach in October 2002 to inform the community and visitors about the potential presence of ordnance and the associated safety measures. The project team discussed the need to put up signs on the beach as soon as

possible to notify the public of the potential munitions hazards. Prior to installing the signs, USACE participated in a Buckroe Beach Civic Association meeting to provide information on the upcoming investigation efforts and to obtain the community's input on the proposed sign for the beach. The sign was revised based on the input received at this meeting and posted on the beach in three locations on February 18, 2003. Brochures were also placed in containers on the signs.

- USACE has participated in a number of Buckroe Beach Civic Association meetings since December 2002 to continue the dialogue with the community. In addition, the City of Hampton coordinated a public meeting on February 27, 2003 at Jones Middle School where USACE presented information on the planned ordnance response efforts for Buckroe Beach. The City advertised the public meeting using a variety of methods including: the Hampton City Page in the *Daily Press* newspaper, bulletin board messages on the City's TV station 47, a mailing to the Buckroe Beach Civic Association, a news release, and a display ad in the *Daily Press*. Approximately 20 people attended this public meeting. At the public meeting, USACE explained why the efforts were needed, the upcoming response plan and timeline, the safety distances required, the detonation procedure, the public communication efforts that were being initiated, the evacuation methods that would be followed, and the estimated cost of the effort. USACE also told the meeting participants that the beach signs would change with the life of the project—that the signs would be updated after the MEC clearance was completed and before the 2005 beach replenishment began. The City mailed information to area residents beginning in March 2003 prior to the munitions sweep, and several times throughout the investigation. The USACE has created a variety of public information tools for these efforts including signs, brochures, a project web site (<http://www.nao.usace.army.mil/Projects/Buckroe/buckroe.html>), and project fact sheets. In addition, the USACE and the City have disseminated joint press releases to the local media at key milestones throughout the project.
- In May 2004, the USACE began conducting community interviews with local officials, residents, and beach visitors to solicit input for the public involvement plan. The interviews were conducted after the ordnance sweeps. Community interview questionnaires were disseminated at a Buckroe Beach Civic Association meeting and by City staff to local residents and visitors at Buckroe Beach. USACE also conducted several interviews by telephone.
- Based on the results of community interviews, the level of community interest was not deemed sufficient to establish a Restoration Advisory Board for Buckroe Beach.
- A Public Involvement Plan (PIP) was produced to comply with the requirements of the NCP. It contained the results of the community interviews. The PIP was made available to the public in the information repositories and online.
- Pursuant to sections 300.430(f)(2) and 300.430(f)(3) of the NCP and section 117(a) of CERCLA, USACE released the Proposed Plan for Buckroe Beach to the public for comment on November 10, 2014. The notice of availability for the RI/FS Report and the Proposed Plan was published on the USACE-Norfolk public notices website on October 30, 2014 (see Appendix A). In that notice the public was informed of the availability of the Proposed Plan and the RI/FS both online and by print copy at the following library locations:
 - Phoebus Branch, 1 South Mallory Street, Hampton, VA. 23663
 - Reference Department, Main Library, 4207 Victoria Blvd., Hampton, VA. 23669

- Northampton Branch, 936 Big Bethel Road, Hampton, VA. 23669
- Willow Oaks Branch, 227 Fox Hill Road, Hampton, VA. 23669

The notice indicated that the public comment period commenced on November 10, 2014 and would close on December 24, 2014 and that a public meeting would be held on December 2, 2014, at the Jones Magnet Middle School, 18919 Nickerson Blvd, Hampton, VA 23663. On November 9, 2014 additional notices (see Appendix A) were published in the *Virginian Pilot* and *Daily Press* newspaper to invite the public to access the Proposed Plan on the USACE–Norfolk website and attend the December 2, 2014 public meeting.

- A public meeting was held on December 2, 2014. The public meeting was used to share information about the remedial investigation activities conducted, the remedial investigation results, and to present the recommendations in the Proposed Plan.

At this meeting, an informal poster presentation of the Remedial Investigation and Feasibility Study Reports and the Proposed Plan was set up, and representatives from USACE were available to the public to discuss concerns, accept comments, and answer questions regarding the preferred alternative presented in the Proposed Plan.

One member of the public attended the public meeting. No verbal or written comments regarding the Proposed Plan were received from the public during the meeting or the comment period. To maintain consistency of this Decision Document with USEPA guidance (USEPA, 1999), a Responsiveness Summary section (Section 3.0) is included in this DD, however, it briefly mentions that no responses were prepared since no comments were received. The material distributed and posters displayed at the December 2, 2014 public meeting, and a transcript/summary, are included in **Appendix A**.

2.5 SCOPE AND ROLE OF RESPONSE ACTION

The scope of the response is to protect human health and the environment from munitions and explosives of concern (MEC) on the stretch of Buckroe Beach affected by past replenishment efforts, that is, from Pilot Avenue in the north to the Buckroe Beach fishing pier in the south (i.e., the Buckroe Beach MRS). The response area includes the dry beach extending out to the Mean Low Tide level, to a depth of 18 inches below ground surface.

2.6 SITE CHARACTERISTICS

The Buckroe Beach FUDS is city-owned and zoned for recreational use (see current zoning in Hampton GIS in **Figure 2-2**). On the land side it borders residential property with many property owners, and the Buckroe Beach City Park. Buckroe Beach FUDS was not used by the military, however nearby military training activities caused MEC items to be deposited in the Chesapeake Bay; some of these MEC items were carried to Buckroe Beach by City of Hampton dredging and beach replenishment, and possibly by the weather.

- Overview of the Site
 - Boundaries: ¼-mile of public beachfront from Pilot Avenue on the North, to the Buckroe Beach fishing pier in the South.
 - Size: 26 acres.
 - Topography: Flat sandy beachfront.

- **Surface and Subsurface Features:** Low concrete seawall along its length; two piers, and two small stone breakwaters.
- **Vegetative or Other Cover:** None.
- **Access:** Unrestricted. Numerous high-density housing borders the beach, as does the Buckroe Beach Park. The beach front is designed for public access.
- **Conceptual Site Model (CSM):**
 - Munitions were brought to the site in 1990 in beach replenishment sand dredged about 2 miles offshore. Most munitions were removed in clearance operations during 1990-1993.
 - Additional replenishment occurred in 1996; munitions screening for the source sand was employed, but was not entirely effective, and small numbers of munitions could have been transported to the site.
 - Much of the added sand has eroded in storm events; munitions that were not cleared could have been buried deeply below instrument detection or transported offshore.
- **Removals and Remedial Actions:**
 - Six removal actions occurred: USACE-directed Visual and Magnetometer Survey and Clearance in 1990, 1991, 1992, 1993, and March and November/December 2003. The final survey and removal included the entire beach response area, including the dry beach, and extending out to 18 inches below the Mean Low Tide water level.
- **Investigation Approach**
 - Visual and Magnetometer Survey and Clearance as noted above: "Removals and Remedial Actions."
 - Munitions Constituents Sampling: In 2004 surface soil was sampled at locations where spent explosively-configured MEC items were found. Munitions constituents detected were below human health screening criteria or within background levels. No groundwater or surface water sampling was required.
- **Known or Suspected Sources of Contamination:** Fired artillery projectiles in the 75-mm size range. These projectiles originate from historical Department of Defense activities within the Lower Chesapeake Bay.
- **Receptor Pathways of Concern:** Human (visitors and construction workers) potential contact with military munitions. A low risk was identified.
- **Likelihood for Migration:** Low, or unlikely, under natural conditions for munitions items; explosive-related munitions constituents (MC) were not detected.

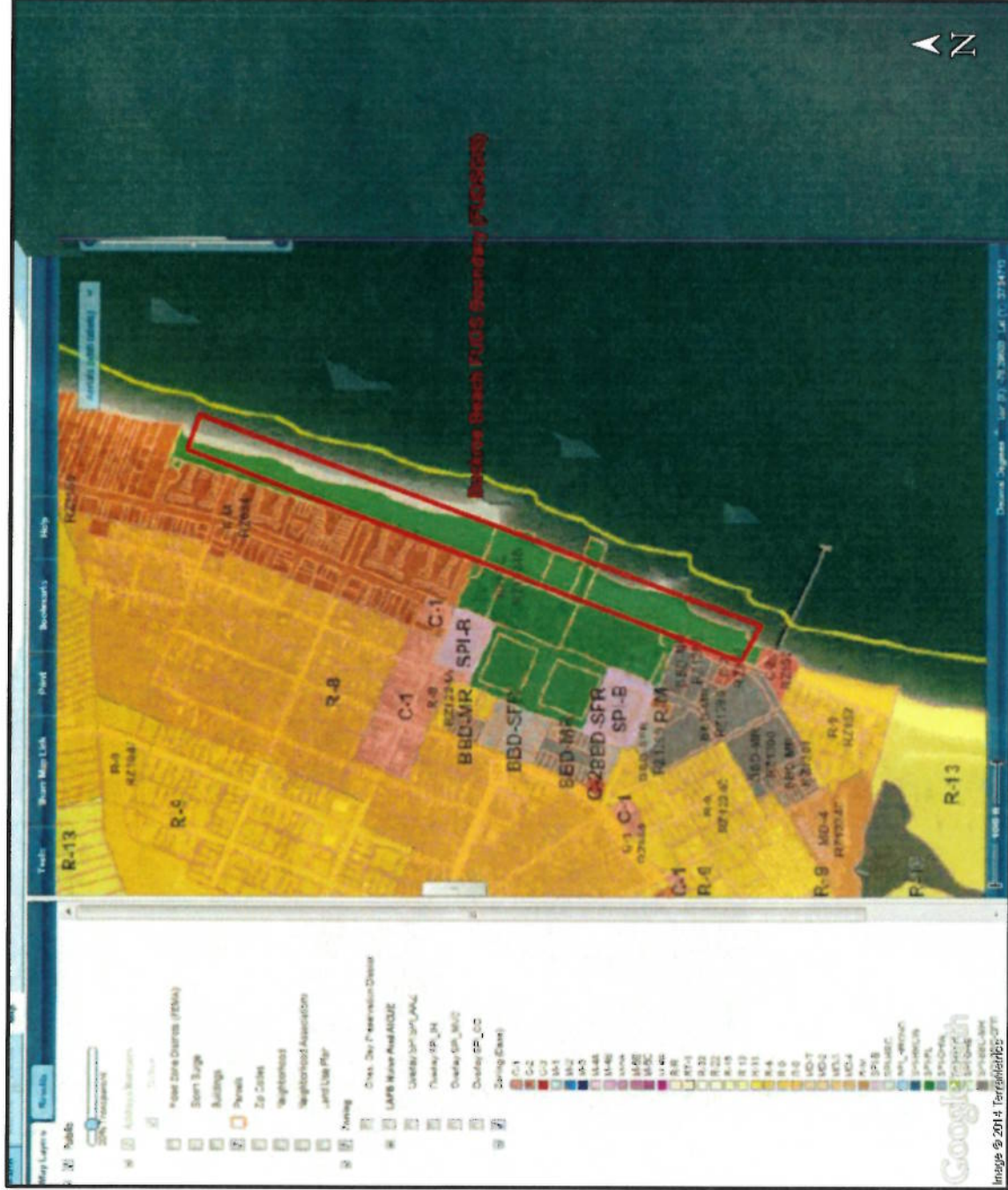


Figure 2-2: Buckroe Beach Zoning Map

(Source: Hampton, VA Geographic Information System (<http://www.hampton.gov>))

2.7 CURRENT AND POTENTIAL FUTURE LAND AND RESOURCE USES

The current and anticipated future use of Buckroe Beach is public recreational. The City of Hampton owns the beach and has designated it for permanent recreational use in its zoning (**Figure 2-2**) and its land use plan (see **Figure 2-3**). Small short-term construction work may also occur to preserve the beach (e.g. erosion control jetties), or enhance recreational use (e.g., piers, small buildings). No surface water is available or suitable for drinking; potable water is available nearby. No groundwater receptors are known for Buckroe Beach. The City of Hampton is supplied with potable water by the Newport News Waterworks, which obtains it primarily from surface water sources. All users at Buckroe Beach are assumed to be supplied by City of Hampton water (HRPDC, 2011).

2.8 SUMMARY OF SITE HAZARDS AND RISKS

A response action under CERCLA is necessary to protect public health and welfare or the environment at the Buckroe Beach FUDS because of the low overall safety hazard for encountering MEC. The following subsections describe the results of the risk evaluations performed during the remedial investigation and described in the RI Report (USACE, 2009). The evaluations comprise two parts, a hazard assessment for encountering MEC items, and a CERCLA-type risk screening for exposure to MC. The results of the latter conclude that no actual or threatened releases of MC from the site were identified that may present an imminent and substantial endangerment to public health, welfare, or the environment.

2.8.1 Risk Evaluation for Munitions

The risk evaluation is included in the RI Report. In view of the importance of the evaluation for this site and its brevity, it is repeated below in its entirety, rather than summarized.

2.8.1.1 Introduction

An explosive safety risk is the probability for munitions to detonate and potentially cause harm as a result of human activities. An explosive safety risk exists if a person can come into contact with munitions and act upon it to cause detonation. The potential for an explosive safety risk depends on the presence of three critical elements: a source (presence of MEC), a receptor (person), and interaction between the source and receptor (such as picking up the item or disturbing the item by digging). There is no risk if any one element is missing. Each of the three elements provides a basis for implementing effective risk-management response actions.

The exposure route for munitions to a receptor is primarily through direct contact as a result of human activity. Agricultural or construction activities involving subsurface intrusion are examples of human activities that will increase the likelihood for direct contact with buried munitions. Munitions will tend to remain in place unless disturbed by human or natural forces, such as wave action, erosion, or frost heave. Movement of the munitions may increase the probability for direct human contact, but not necessarily result in a direct contact or exposure.

A qualitative risk evaluation was conducted using the USACE Munitions Hazard Assessment (UMHA) draft guidance document (USACE 2005) to assess explosive safety risks to the public at the Buckroe Beach site. The risk evaluation presented herein is based on the site characterization findings presented for the Beach MEC source area, as defined by the MEC CSM.

2.8.1.2 Definition of Risk Evaluation Factors, Categories, and Subcategories

The potential risks posed by munitions are characterized qualitatively by evaluating three primary risk factors. The three primary risk factors include: 1) presence of a munitions source, 2) site characteristics that affect the accessibility or pathway between the source and human receptor, and 3) human factors that define the number of receptors and type of activities that may result in direct contact between a receptor and munitions source. By performing a qualitative assessment of these three risk factors, an overall assessment of the explosive safety risk posed by munitions is evaluated. The following paragraphs describe the components of each of the primary risk factors. A qualitative assessment of these three risk factors is evaluated in the next two sections where the Consequence Potential and Human Interaction Potential are discussed.

2.8.1.3 Consequence Potential

The consequence factors are munitions type, severity, sensitivity, and receptor behavior.

Munitions Type and Severity

The munitions type affects the likelihood of injury and the severity of exposure. If multiple munitions items are identified in an area, that item which poses the greatest risk to public health is selected for risk evaluation. There are three categories of munitions type, as shown in **Table 2-1**. These categories are presented in order of severity from highest to lowest risk.

Table 2-1: Munitions Severity Categories

Category	Description
Most severe	Munitions that may be lethal if detonated by an individual's activities
Moderately severe	Munitions that may cause major injury to an individual if detonated by an individual's activities
Least severe	UXO that may cause injury to an individual if detonated by an individual's activities

(Source: USACE, 2009)

Eleven munitions debris (MD) items were discovered and disposed of during the TCRA. Seven of these were 75-mm MK-1 shrapnel projectiles; two were 40-mm practice projectiles and two were projectile fuzes. Thirteen non-MEC-related items were also recovered. All of the MD items were located in the subsurface depth of greater than 12 inches below ground surface. However, during the TCRA removal actions, no confirmed live MEC items were found.

Munitions Sensitivity

Munitions sensitivity affects the likelihood of detonation and the severity of exposure. Factors considered in evaluating sensitivity include fuzing and environmental factors such as weathering. There are four potential categories of munitions sensitivity. When multiple categories of munitions types are discovered in an area, the highest risk subcategory is used in the risk evaluation. The categories of sensitivity are defined and presented in order from highest to lowest in **Table 2-2**. For Buckroe Beach, the category of "Insensitive" is assigned to the munitions sensitivity as no other category applies.

Table 2-2: Munitions Sensitivity

Munitions Category	Sensitivity
Highly Sensitive	All UXO that is very sensitive, i.e., electronic fuzing, land mines, booby traps
Sensitive	Any fuzed UXO or fuzed DMM that has potentially undergone arming process
Moderately Sensitive	A DMM that is fuzed but has not undergone the arming sequence
Insensitive	An unfuzed munition or explosive

(Source: USACE, 2009)

Receptor Behavior

The behavior of people on Buckroe Beach directly influences the potential for a completed pathway. If people are trained not to pick up munitions items, then the potential for negative consequences of a completed exposure pathway is much reduced.

2.8.1.4 Human Interaction Potential

There are three categories that are evaluated when analyzing the potential for human interaction with munitions and the possibility of a completed exposure pathway, these are: 1) source potential; 2) interaction potential; and 3) access potential.

Source Potential

The source potential is the description of the likelihood to find munitions on the site. Currently, the source potential is considered to be low. This is mainly due to the extensive removal actions that have been described previously The likelihood of finding MEC has become smaller after the last round of beach replenishment used [screening and monitoring] to ensure that neither MEC nor MD would be deposited on the beach.



Figure 2-3: Buckroe Beach Land Use Planning Map
(Source: Hampton, VA Geographic Information System (<http://www.hampton.gov>))

Interaction Potential

The interaction potential is a function of the expected minimum depth of the munitions and the intrusion depth associated with beach-going activities at the site. The munitions depth distribution refers to where the munitions are located vertically in the subsurface. There exists a direct inverse relationship between the depth at which munitions are found and the likelihood of exposure to the munitions. That is, the greater the depth where the munitions are found, the lower the risk of exposure. There are two pertinent categories for describing munitions depth: surface and subsurface. Surface munitions are those munitions found either sticking out from the beach surface or lying on top of the sand. All other munitions are considered to be subsurface. The depth distribution is not as critical a variable as for other terrestrial sites because, on a beach, storms can uncover munitions items that had previously been at depth. Therefore, for this site, even though the munitions items historically were dug from near surface and below, they will all be considered as surface and available for contact by receptors. The most common site activities include swimming, fishing, sunbathing, metal detecting and typical sand activities such as excavating sand for a sand castle – activities both surficial and intrusive in nature. Since this site is a beach and all munitions have been identified as potentially being at the surface then *any activity* will result in the interaction potential being very high.

Access Potential

The access potential contains three parts: 1) number of receptors using the site; 2) the receptor intensity and; 3) portability of the munitions. The number of receptors using the site refers to the number of people that potentially access the munitions source area on a daily basis. The number of people using Buckroe Beach affects the likelihood of encountering munitions. A direct relationship exists between the number of people and the risk of exposure. The population living on the Buckroe Beach site is zero (0). No daily visitor information was available from the Buckroe Beach Civic Association. However, a local newspaper article projected over 100,000 visitors to the beach during the summer of 2005 – that would mean approximately 3,000 people every day over the summer.

As has been mentioned previously, access is unrestricted. The receptor intensity or the amount of time that a receptor interacts with a site would increase the likelihood of contact with munitions. Since this is a public access beach the intensity of interaction can be thought of as strong. The Buckroe Beach site is open to the public for all recreational beach going activities with the exception of driving on the beach, which is prohibited (there are no ramps for vehicles, further limiting vehicle access). The accessibility to enter the site is unrestricted and the site is easily accessible by foot. The site is visited daily by area residents and is used heavily during the summer months by residents and visitors to the area.

Finally, the portability of munitions impacts the potential for receptors to access the munitions. A smaller, lighter item will be more likely to be picked up than a large item. All of the munitions at the site are considered to be either "highly portable" at underneath 5 pounds, or "portable" at between 5 and 50 pounds. Therefore, using all three of the above factors for assessing access potential, the "human interaction potential" or rather the possibility of there being a complete exposure pathway can be assessed as high.

2.8.1.5 Summary of Hazard Assessment Results

In summary, there were two potentials that were covered in the hazards assessment: consequence and human interaction. The consequence potential involved the severity and sensitivity of munitions as well as the behavior of the people interacting with those munitions. The consequence potential was deemed low overall due to the lack of munitions items found that were sensitive (i.e., UXO) or severe. The human interaction potential involved the type of sources for munitions as well as interaction and access potential. The human interaction potential was high due to the fact that this site is a public access beach with lots of visitors daily during the summer season. Overall, a finding of low safety risk was found due to a combination of each of the primary hazard factors that are presented above. Even though there is a high potential pathway, the past removal actions in combination with the likelihood that any possible remaining munitions items are not sensitive combine to give a finding of low overall safety hazard.

2.8.2 **Human Health Risk Evaluation**

Based on the Final Report Environmental Sampling, Buckroe Beach, Hampton, VA, dated July 2004, neither semi-volatile organic compounds (SVOCs) nor explosive compounds were detected above their respective reporting limits. As for inorganics, aluminum, antimony, barium, beryllium, chromium, cobalt, copper, cyanide, lead, manganese, nickel, silver, vanadium and zinc were detected below the screening criteria. Cadmium, mercury, selenium, and thallium were not detected. Arsenic was detected in all samples at concentrations ranging from 0.8 mg/kg to 2.8 mg/kg (or ppm). These levels were well within natural levels of arsenic found in soil in the Eastern United States, which range from 0.1 to 73 ppm, with a mean of 5 ppm. Although iron was detected in every sample and exceeded the adjusted screening criteria in two samples, the concentrations were flagged due to blank contamination. Calcium, magnesium, potassium, and sodium were all present but have no screening value criteria available for comparison. These heavy metals are essential nutrients and are not considered contaminants of potential concern at Buckroe Beach.

Based on these conclusions, no MC were identified that (1) resulted from the MEC located on Buckroe Beach, and (2) potentially posed an unacceptable risk. Based on this, no human health risk assessment was necessary.

2.8.3 **Ecological Risk Evaluation**

Soil (sand) samples were collected on the beach. As noted in the section above, no SVOCs or explosives were detected and the metals that were detected were at low concentrations. As noted in the Proposed Plan (USACE, 2013), the detected metals concentrations were either attributed to background, or were below human health or ecological screening values. Hence there is no adverse ecological risk due to MC.

2.9 **REMEDIAL ACTION OBJECTIVE**

The goal of the Buckroe Beach remedial action is to reduce explosives safety risk to ensure protection of human health, public safety, and the environment. The remedial action objective (RAO) for the Buckroe Beach is to minimize or eliminate the explosive safety risk to the public and site personnel. The 2005 project used screens on the dredge intake and beach discharge areas to preclude placing any MEC with the sand. The screening process proved to be very effective and no MEC was located on the beach relating to the 2005 project.

2.10 DESCRIPTION OF ALTERNATIVES

All known munitions were removed during the TCRA in 2003 and the subsequent Remedial Investigation in 2004 indicated no unacceptable risk from MC at the site. However, there remains the possibility of MEC in the tidal surf zone that may potentially move to the surface as a result of erosion or migration, especially during storm events. The risk to encounter MEC in this scenario is low, but poses an unacceptable risk. The Focused Feasibility Study (FFS) for Buckroe Beach assessed two alternatives: No Further Action and Land Use Controls (LUCs) (USACE, 2009). State and local governments agree that LUCs are the appropriate remedy for Buckroe Beach. Since the results from the RI indicate that no semi-volatile or explosive compounds of concern relating to MEC or MEC-related activities are present at Buckroe Beach, and trace metals are present at concentrations either below screening criteria or within the range of accepted natural background concentrations, USACE found no justification to evaluate additional alternatives which require further excavation or intrusive activity to clean 26 acres of the beach.

The alternatives considered were (1) No Further Action – Required to be evaluated by the NCP, and (2) Land Use Controls, comprised of a) Administrative and Legal Mechanisms, b) Engineering Controls, and c) Educational Controls.

2.10.1 Alternative 1 – No Further Action

No Further Action is provided, as required under CERCLA and the NCP, as a baseline for comparison to the other proposed alternatives. Alternative 1 is for the government to take no further action in regards to locating, removing, and disposing of any potential MEC present at the site. In addition, no public awareness or education training would be initiated with regard to the potential risk of MEC. The No Further Action alternative assumes continued land use of the Buckroe Beach in its present state.

2.10.2 Alternative 2 – Land Use Controls

2.10.2.1 Administrative and Legal Mechanisms

Buckroe Beach is owned by the City of Hampton and zoned for recreational use. The City of Hampton issues dig permits to entities that plan to dig on the beach. Administrative and legal mechanisms are not part of this alternative.

2.10.2.2 Engineering Control

Controls are designed to limit public access and/or exposure to residual contamination that remains on site to an acceptable level. The recommended engineering control for Buckroe Beach is signage. The signs will be provided by the USACE. The associated cost for new signs is around \$2,000 per year for the USACE.

2.10.2.3 Educational Control

Educational programs are a component of LUCs and are intended to inform the public of 1) the types of hazards that might remain at the site, 2) identification of hazards and safety precautions, and 3) how to inform authorities. Presently, there is no educational program available that includes ordnance safety procedures for local residents or visitors. An educational program will be incorporated into the present educational system to help educate and thus protect the public from possible ordnance hazards. Specific topics to be addressed in the educational program will include the following: community education and outreach activities including, but not limited to:

- Distribution of informational brochures/fact sheets.
- Distribution of visual and audio educational and training media.
- Performance of classroom education and training as needed.

The annual cost associated with educational control should not exceed \$6,000 for the USACE.

The FFS underestimated the costs for controls. The materials did not contain the administrative effort for design and procurement. Also during the public comment period it was recognized that a Land Use Control Implementation Plan (LUCIP) and safety training video would be required at a cost of approximately \$60,000.

2.11 SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

The alternatives were compared to the nine criteria listed in the NCP. The first two criteria below are known as threshold criteria, because the alternatives must meet them in order to be selected. The next five criteria are known as balancing criteria because they help balance the advantages and disadvantages of the various alternatives. Finally, the last two criteria are known as modifying criteria, as they take into account local preferences which may cause the alternatives to be adjusted or modified.

2.11.1 Overall Protectiveness of Human Health and the Environment

Although a TCRA addressed the surfaced munitions at Buckroe Beach in 2004, there is an unacceptable risk that buried ordnance may still be present at depth below the instrument detection capability that may erode to the surface, as well as the possibility of MEC in the tidal surf zone that may migrate, especially during storm events. Therefore, Alternative 1 is not protective because no further action would be taken to prevent human exposure to MEC. Alternative 2 is protective because the LUCs would reduce exposure and inform citizens how to respond in the event they discover a munition item.

2.11.2 Compliance with Applicable or Relevant and Appropriate Requirements (ARARs) and To Be Considered Criteria (TBCs)

There are no regulations or criteria associated with Alternative 1. No ARARs have been identified for munitions at Buckroe Beach.

2.11.3 Long-Term Effectiveness and Permanence

Alternative 1 is not effective or permanent. Alternative 2 is effective and permanent. Because it sufficiently educates the public about zoning and permitting requirements, the risk of encountering MEC, and how to respond in the event MEC is encountered. The LUCs recommended as Alternative 2 have been designed to provide effectiveness in the long term.

2.11.4 Reduction of Toxicity, Mobility, or Volume (TMV) of Contaminants Through Treatment

Neither alternatives 1, nor 2, will reduce the TMV of MEC through treatment at Buckroe Beach. However, Alternative 2 will minimize the chance of injury by implementation of MEC safety training for items that potentially move to the surface due to erosion or migration during storm events. If MEC items are found due to storm-caused erosion or other events, and the items are deemed hazardous, they will be rendered safe, likely by controlled detonation, which may be deemed a form of treatment to render them not hazardous.

2.11.5 Short-Term Effectiveness

Because there are no construction activities associated with either alternative, Alternatives 1 and 2 would not present significant additional risk to the community, workers, beachgoers, or the environment. Alternative 2 (LUCs) will provide a greater amount of protection/effectiveness in the short-term than the No Further Action alternative because signage and educational materials will inform the public to recognize munition items.

2.11.6 Implementability

The No Further Action alternative would be easily implemented because it requires no further action. The LUCs recommended as Alternative 2 could also be easily implemented because they pose no technical difficulties and the materials and services needed are available.

2.11.7 Cost

The cost to perform each alternative at Buckroe Beach is as follows:

Alternative 1 = \$0

Alternative 2 = \$100,000 in the first five years, then somewhat reduced in subsequent five year periods

For Alternative 2, the implementing costs associated with installing and maintaining signs and conducting educational programs are estimated to be approximately \$8,000/year or \$40,000 for five years. The majority of this cost is associated with preparation of fact sheets, public meetings and classroom presentations. During the public comment period it was recognized that a Land Use Control Implementation Plan (LUCIP) and a safety training video would be required at a cost of approximately \$60,000, giving a total cost for the first five years for the selected alternative of \$100,000. Subsequent five year periods will reflect the costs of LUCs only. If it is determined that a new video or LUCIP is needed in subsequent five year periods, costs for that period would include the costs for LUCs and preparation of the new video or LUCIP. Costs for subsequent five year periods are expected to increase due to inflation.

2.11.8 State Acceptance

The State of Virginia (VDEQ) has been supportive of Alternative 2.

2.11.9 Community Acceptance

The City of Hampton has been supportive of Alternative 2. The City and the Buckroe Beach Civic Association (BCA) have been active participants in coordination of public communication efforts and enhanced safety at Buckroe Beach

There has been minimal public concern about the site during the performance of the RI/FS and Proposed Plan. The public had opportunity to review the Proposed Plan and to attend a public information meeting where the Alternative 2 was discussed as the proposed remedy. Public attendance was minimal and no public comments were received on the Proposed Plan.

2.12 PRINCIPAL THREAT WASTES

Principal threat wastes are wastes that are liquid, highly toxic, or highly mobile. Military Munitions do not meet this definition. The principal threat posed at Buckroe Beach is from military munitions which,

if not detonated, may pose a threat of detonation, or contain sufficient explosive filler to be a source of contamination migration and exposure. For Buckroe Beach, all such identified, accessible munitions have already been located and removed to the detection ability of the equipment. The remedy is still needed because the detection method could not reach all possible depths of the beach, nor was it used in greater depths of water off the beach from which munitions could be washed to the beach again by storm events.

2.13 SELECTED REMEDY

The selected remedy for Buckroe Beach is Alternative 2, Land Use Controls. This remedy was selected over the No Further Action alternative because it meets the threshold criteria and provides the best balance of tradeoffs relative to the balancing and modifying criteria. This alternative is protective of human health and the environment and is an effective and permanent remedy by implementing LUCs in the form of notifications and educational measures. This will increase public awareness and reduce the risk associated with MEC. During the public comment period it was recognized that a Land Use Control Implementation Plan (LUCIP) and safety training video would be required at a cost of approximately \$60,000. Installing and maintaining signs and conducting educational programs are expected to cost the USACE approximately \$8,000 per year, giving a total cost for the first five years for the selected alternative of \$100,000. Subsequent five year periods will reflect the costs of LUCs only. If it is determined that a new video or LUCIP is needed in subsequent five year periods, costs for that period would include the costs for LUCs and preparation of the new video or LUCIP. Costs for subsequent five year periods are expected to increase due to inflation.

- USACE will provide munitions safety training to the City planning and zoning division personnel upon request
- USACE will provide the City of Hampton with site specific munitions safety flyers for presentation, distribution, or mailing to residential properties. The USACE Point of Contact must be provided on munitions safety training flyers.
- In the event of future munitions findings, after the City of Hampton has arranged for safe removal through its police department and local DoD EOD, USACE requests that all munitions findings be reported to USACE for further evaluation. Any findings should be reported to:

Norfolk District, Public Affairs Office, 803 Front Street, Norfolk, VA 23510, Tel: 757-201-7500, Email: cenao-pa@usace.army.mil

AND

Baltimore District Corporate Communication Office, City Crescent Building, 10 South Howard Street, Baltimore, MD 21201,
Tel: 1-800-434-0988, Email: cenab-pa@usace.army.mil

2.14 STATUTORY DETERMINATIONS

This section provides a brief, site-specific description of how the Selected Remedy satisfies the statutory requirements of CERCLA §121 (as required by NCP §300.430(f)(5)(ii)) and explains the five-year review requirements for the Selected Remedy.

2.14.1 Protection of Human Health and the Environment

The selected remedy protects human health and the environment through notification and educational measures. The major threat has already been abated through past removal actions, and the risk of munitions encounter has been lowered to the point that the selected remedy is protective. Because of this remedy, recreational site users will have the opportunity to be aware of potential munitions, to know not to disturb or remove them if they are encountered, and to know how to report them. More intensive site users, like treasure hunters or construction and maintenance personnel who may contact subsurface sand, will be informed that they must first receive orientation training for identifying and reporting munitions to obtain digging permits.

2.14.2 Compliance with Applicable or Relevant and Appropriate Requirements

No ARARs have been identified for munitions with which this remedy would have to comply.

2.14.3 Cost-Effectiveness

A cost-effective remedy is one whose "costs are proportional to its overall effectiveness" (NCP §300.430(f)(1)(ii)(D)). The "overall effectiveness" of a remedial alternative is determined by evaluating the following three of the five balancing criteria used in the detailed analysis of alternatives: (1) Long-term effectiveness and permanence; (2) Reduction in toxicity, mobility and volume (TMV) through treatment; and, (3) Short-term effectiveness.

The selected remedy is cost-effective since it achieves short-term and long-term effectiveness at a relatively low cost. Reductions in TMV through treatment have already been accomplished during past removal actions. Any future munitions finds will be either removed or destroyed onsite.

2.14.4 Utilization of Permanent Solutions and Alternative Treatment (or Resource Recovery) Technologies to the Maximum Extent Practicable

The selected remedy is a permanent solution for munitions in a beach environment. In prior removal actions, munitions have been located and removed from Buckroe Beach to the extent possible using typical hand-held detection equipment. The decision document will be placed in the four information repositories, and a public notice describing the remedy will be published in a major newspaper. Signage will be continued.

This multilayered approach to documenting the site and informing the public will memorialize the requirements and make this remedy permanent.

Munitions by necessity are generally addressed by detonation, a form of treatment; off-site disposal is not an option for explosives-containing munitions. Such treatment has occurred at Buckroe Beach in prior removal actions, and although the selected remedy itself does not include treatment, if any munitions are found that have a possible explosion hazard, safe controlled detonation will be used to render them non hazardous.

2.14.5 Preference For Treatment as a Principal Element

Treatment by detonation has been used previously for found MEC at Buckroe Beach, and will likely be used again if any potentially explosive items are found.

2.14.6 Five –Year Review Requirements

Under CERCLA Section 121(c), a five-year review of a remedial action is required whenever site conditions do not allow for Unrestricted Use and Unlimited Exposure (UU/UE). The selected remedy does not allow for UU/UE. Because of this, five-year reviews are necessary until the risk of munitions exposure can be shown to be acceptable with no restrictions on the site.

The USACE is required to conduct these five-year reviews at Buckroe Beach. During the five-year review period, USACE, the City of Hampton and the State will discuss and evaluate the effectiveness of the remedy to ensure that human health and environment are still being protected. The initial Five-Year Review will be completed within five years of the date this Decision Document is signed by the approving commander.

2.15 DOCUMENTATION OF SIGNIFICANT CHANGES

The Proposed Plan for Buckroe Beach was released for public comment on 10 November, 2014. The Proposed Plan identified implementation of Land Use Controls as the remedy for the site.

USACE has determined that no significant changes to the Proposed Plan of Land Use Controls are necessary or appropriate.

However, during the public comment period it was recognized that a Land Use Control Implementation Plan (LUCIP) and safety training video would be required at a cost of approximately \$60,000, giving a revised total cost for the first five years for the selected alternative of \$100,000. Subsequent five year periods will reflect the costs of LUCs only. If it is determined that a new video or LUCIP is needed in subsequent five year periods, costs for that period would include the costs for LUCs and preparation of the new video or LUCIP. Costs for subsequent five year periods are expected to increase due to inflation.

3.0 RESPONSIVENESS SUMMARY

The Proposed Plan for Buckroe Beach was released for public comment from November 10, 2014 to December 24, 2014. A public availability meeting was held on 2 December, 2014 at the Jones Middle School in Buckroe Beach. The Proposed Plan identified Land Use Controls as the recommended decision for the site. USACE received no written or verbal public comments on the Proposed Plan either during or after the comment period. Because no comments were received, no responsiveness summary is necessary.

4.0 REFERENCES

EHS, 1991. *Final Report, Unexploded Ordnance Clearance, Buckroe Beach, Hampton, VA*, by Environmental Hazards Specialists International, Inc., for USACE-Huntsville Division, Contract DACA87-91-P-0775, 1991

Hampton, 2006, *City of Hampton Community Plan (City Council Adopted February 8, 2006)*, undated, available online at <http://www.hampton.gov/DocumentCenter/Home/View/574>.

Hampton, 2014, *City of Hampton Geographic Information System*, <http://www.hampton.gov/index.aspx?NID=1850>, accessed April 2014.

HQDA, 2007. *Army Regulation 200-1, Environmental Protection and Enhancement*, Headquarters, Department of the Army, Washington DC, 13 December 2007 (available at http://www.apd.army.mil/pdffiles/r200_1.pdf)

HRPDC, 2011. *Hampton Roads Regional Water Supply Plan*, Hampton Roads Planning District Commission, July 2011 (available at <http://www.hrpdc.org/departments/water-resources/download-the-plan/>) (Section 1 and Appendix A, Peninsula Data Tables)

UDA, 2005, *Buckroe Master Plan, Hampton, Virginia (adopted by City Council on March 23, 2005)*, by Urban Design Associates, March 2005 (accessed at <http://www.hampton.gov/DocumentCenter/View/924>).

USACE, 1990, *Findings and Determination of Eligibility*, U.S. Army Corps of Engineers, November 28, 1990.

USACE, 2004a. *Environmental Quality, FORMERLY USED DEFENSE SITES (FUDS) PROGRAM POLICY*, Engineering Regulation 200-3-1, U.S. Army Corps of Engineers, 10 May 2004 (available at http://www.publications.usace.army.mil/Portals/76/Publications/EngineerRegulations/ER_200-3-1.pdf)

USACE, 2004b. *Final Report, Environmental Sampling, Buckroe Beach, Hampton, Virginia*, by U.S. Army Corps of Engineers-Norfolk District, July 2004.

USACE, 2005. *Public Involvement Plan, Buckroe Beach*, by Chaloux Environmental Communications, Inc. for U.S. Army Corps of Engineers-Norfolk District, February.

USACE, 2009. *Final Remedial Investigation and Feasibility Study for Munitions and Explosives of Concern, Buckroe Beach, Hampton, Virginia*, U.S. Army Corps of Engineers, Baltimore District, September 2009. (The Feasibility Study portion of this document, though not titled as such, refers to itself as a "Focused Feasibility Study (FFS)", and is referred to that way in this decision document.)

USACE, 2015. *Final Proposed Plan for Buckroe Beach Formerly Used Defense Site (FUDS), Hampton, Virginia*, U.S. Army Corps of Engineers, Norfolk District, April 2015.

USEPA, 1999. *A Guide To Preparing Superfund Proposed Plans, Records Of Decision, And Other Remedy Selection Decision Documents*, U.S. Environmental Protection Agency, EPA 540-R-98-031, July 1999.

UXB, 1990. *Unexploded Ordnance UXO Clearance Final Report, Buckroe Beach, Hampton VA*, by UXB International Inc, 14800 Conference Center Drive, Suite 100, Chantilly VA 22021-3806, for US Army Corps Of Engineers, Huntsville, AL District, Contract Number DACA87-90-P-1195, Revised November 21 1990

UXB, 1992. *Final Report, Ordnance Removal Actions, Buckroe Beach Hampton, VA*, by UXB International, Inc., for USACE-Huntsville, contract DACA87-92-Q-0137, September 18, 1992

UXB, 1993. *Final Report, Ordnance Removal Actions, Buckroe Beach Hampton, VA* by UXB International, Inc, for USACE-Huntsville, contract DACA87-93-P-0860, April 19, 1993

DoD, 2012. Manual 4715.20, *Defense Environmental Restoration Program (DERP) Management*, U.S. Department of Defense , March 9, 2012, available at <http://www.dtic.mil/whs/directives/corres/pdf/471520m.pdf>

U.S. Department of Health and Human Services, Public Health Service, Agency for Toxic Substances and Disease Registry (ATSDR), *Toxicological Profile for Arsenic*, September 2000, <http://www.atsdr.cdc.gov/toxprofiles/tp2.html>

Weston, 2004. *Site-Specific Final Report for the Ordnance and Explosives(OE) Time Critical Removal Action (TCRA), Buckroe Beach, Hampton, Virginia*, by Weston Solutions for U.S. Army Corps of Engineers-Baltimore District, February 2004, revised May 2004.

APPENDIX A Public Meeting Summary

PUBLIC NOTICES

Daily Press

Order ID: 2817202

Printed: 11/4/2014 12:29:22 PM

Page 1 of 2

GROSS PRICE *: \$401.17

* Agency Commission not included

PACKAGE NAME: DP Legal
Notices

Product(s): Daily Press, dailypress.com
AdSize(s): 1 Column,
Run Date(s): Sunday, November 09, 2014
Color Spec: 4C

Preview

PUBLIC COMMENT PERIOD AND MEETING

The U.S. Army Corps of Engineers is proposing placing land use controls, such as signs, training and education materials, for the Buckroe Beach Formerly Used Defense Site in Hampton, Virginia. The Corps of Engineers invites the community to attend a public meeting to learn more about the site and proposed plan:

When:
Dec. 2, 2014 from 6:30-8:30 p.m.
Where:
Jones Magnet Middle School, 1819
Nickerson Blvd., Hampton, VA
23663

You are encouraged to review the project documents in the public record and submit comments on the Draft Final Proposed Plan, which can be found in these locations:

- Phoebus Branch, 1 South Mallory Street Hampton, VA 23653
- Reference Department, Main Library, 4207 Victoria Blvd., Hampton, VA 23669
- Northampton Branch, 936 Big Bethel Road Hampton, VA 23669

Daily Press

Order ID: 2817202

Printed: 11/4/2014 12:29:22 PM

Page 2 of 2

GROSS PRICE *: \$401.17

* Agency Commission not included

PACKAGE NAME: DP Legal
Notices

- Willow Oaks Branch, 227 Fox Hill Road, Hampton, VA 23669

A 45-day public comment period will run from Nov. 10 - Dec. 24, 2014. Written comments can be sent to the following mailing address: U.S. Army Corps of Engineers, ATTN: Andrea Takash, Rm. 11400, 10 South Howard St., Baltimore, Md. 21201, or by e-mail to Andrea.M.Takash@usace.army.mil no later than 26 December, 2014.

For more information about the project, please contact George Follett, project manager, at 410-562-6743 or george.c.follett@usace.army.mil.

BALTIMORE DISTRICT

US Army Corps of Engineers

Search Baltimore District

ABOUT BUSINESS WITH US MISSIONS LOCATIONS CAREERS MEDIA LIBRARY CONTACT

HOME > MISSIONS > REGULATORY > PUBLIC NOTICES > PUBLIC NOTICE VIEW

SHARE Email Print

Buckroe Beach Formerly Used Defense Site comment period and meeting

Posted: 11/9/2014
Expiration date: 12/27/2014

The U.S. Army Corps of Engineers is proposing placing land use controls, such as signs, training and education materials, for the Buckroe Beach Formerly Used Defense Site in Hampton, Virginia.

The Corps of Engineers invites the community to attend a public meeting to learn more about the site and proposed plan Dec. 2, 2014 from 8:30-8:30 p.m. at Jones Magnet Middle School, 1819 Nickerson Blvd., Hampton, VA 23663.

You are encouraged to review the project documents in the public record and submit comments on the Draft Final Proposed Plan, which can be found by clicking [here](#) or in one of these four locations:

- Phoebus Branch, 1 South Mallory Street, Hampton, VA 23663
- Reference Department, Main Library, 4207 Victoria Blvd., Hampton, VA 23669
- Northampton Branch, 938 Big Bethel Road, Hampton, VA 23669
- Willow Oaks Branch, 227 Fox Hill Road, Hampton, VA 23669

A 45-day public comment period will run from Nov. 10 – Dec. 24, 2014. Written comments can be sent to the following mailing address: U.S. Army Corps of Engineers, ATTN: Andrea Takash, Rm. 11400, 10 South Howard St., Baltimore, Md. 21201; or by e-mail to: andrea.M.Takash@usace.army.mil no later than Dec. 28, 2014.

For more information about the project, please contact George Follett, project manager, at 410-962-6743 or george.c.follett@usace.army.mil.

Buckroe Beach Formerly Used Defense Site

BUILDING STRONG

SHARP GALILEO U.S. ARMY YouTube Facebook Twitter

Accessibility	Link Disclaimer	Site Map
Contact Us	No Fear Act	USA.gov
FOIA	Privacy & Security	
Information Quality Act	Public Inquiries	

HAMPTON VA

TO: George Wallace, Mayor and Members of Hampton City Council
Mary Bunting, City Manager

FROM: James T. Wilson, Director

DATE: October 30, 2014

SUBJECT: BUCKROE BEACH PROPOSED PLAN

Attached is the finalized version of the draft proposed plan for Buckroe Beach related to the history of past ordnance findings.

We are completing the process of this project with the staff that we have been working with during the entire project. This includes representatives from Virginia Department of Environmental Quality (VADEQ), United States Army Corps of Engineers (USACE) Project Team, and members who are knowledgeable on the subject from Baltimore and Norfolk's Public Affairs offices.

In conclusion of this process we will have the attached document available for public review at Hampton Public Libraries and conducting a public meeting, which is tentatively scheduled for Tuesday, December 2, 2014 at Jones Magnet School starting at 6:30 p.m. (pending school authorization for facility usage).

The meeting will have our staff present and members of the project team to answer any questions the public may have related to this project.

Parks and Recreation has training in place and ongoing each year for new staff members and metal detector users at the beach. This is a basic house cleaning process by the state and government contractors to put closure to the job.

I will be more than happy to address any questions you may have related to this process.

Hampton Parks and Recreation
22 Lincoln Street | Hampton, Virginia 23669
www.hampton.gov | P: (757) 727-6348

PUBLIC MEETING TRANSCRIPT

Public Meeting Transcript

Meeting Date: December 2, 2014

Location: Jones Magnet Middle School, 18919 Nickerson Blvd, Hampton, VA 23663

Purpose: To provide an information session to the public regarding the Proposed Plan for Buckroe Beach

Government Attendees:

George Follett, Ordnance and Explosives Specialist, U.S. Army Corps of Engineers, Baltimore District;
Gerry Rogers, Public Affairs Specialist, U.S. Army Corps of Engineers, Norfolk District;
James Wilson, Manager of Buckroe Beach Park, Department of Public Works, City of Hampton, Virginia
Michelle Hollis, Virginia Department of Environmental Quality
Donnie Tuck, Hampton City Council

Public Attendee:

Leon C. Kimber

Discussion: No formal presentation was given; rather, Government personnel were stationed near the posters to answer questions from the public. One member of the public attended. Government personnel explained to him the Proposed Plan, and future activities for the site. He was attentive and did not express any significant comments or concerns.

POSTERS DISPLAYED AT PUBLIC MEETING

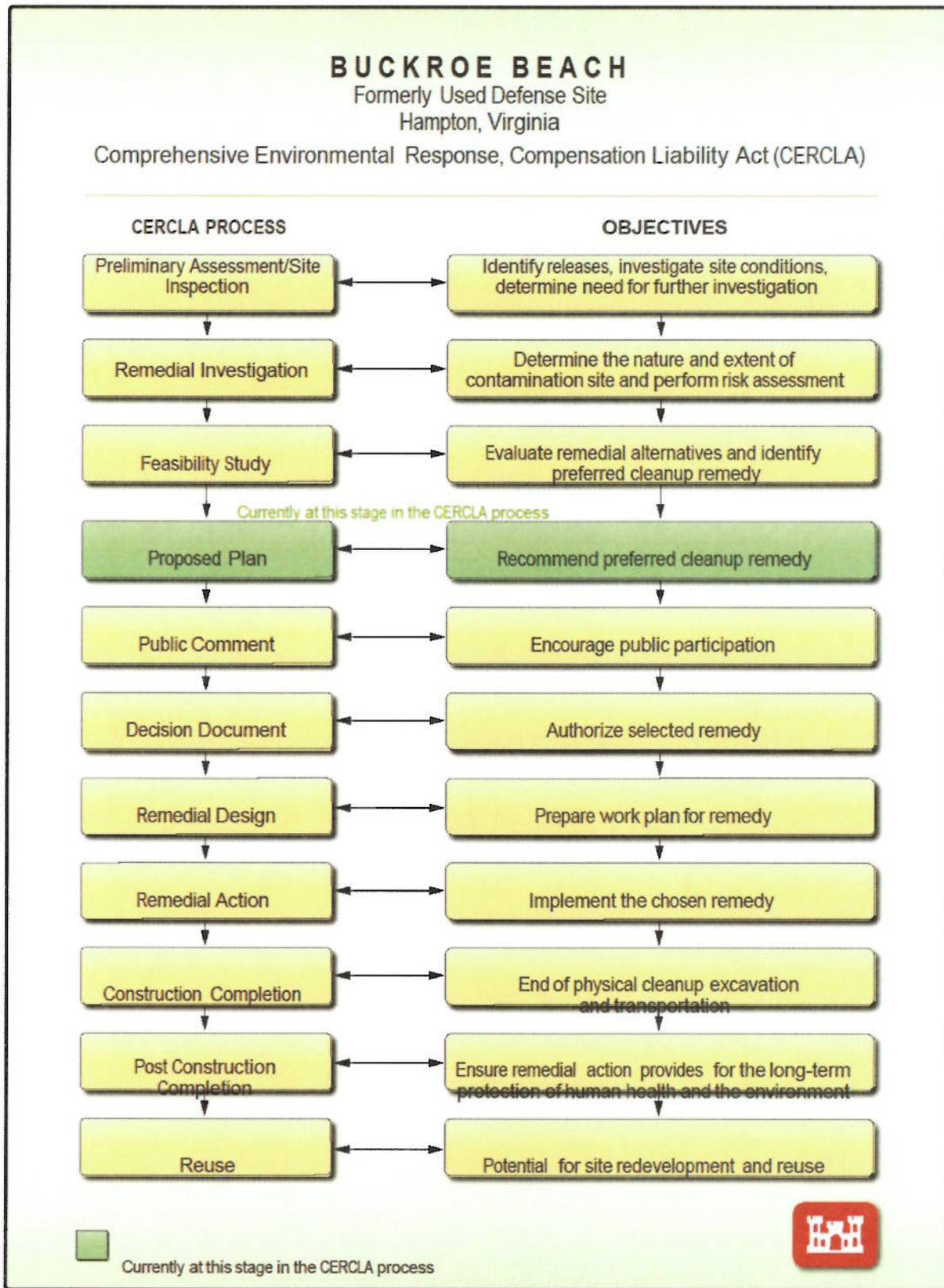
BUCKROE BEACH
Formerly Used Defense Site
Hampton, Virginia

Welcome!

PUBLIC MEETING
PLEASE SIGN IN



U.S. ARMY CORPS OF ENGINEERS, BALTIMORE DISTRICT
10 South Howard Street
Baltimore, Maryland





Primary Sample Locations

The purpose of this sampling event was to determine the presence or absence of Semi Volatile Organic Carbons, explosives, and metals in soil at Buckroe Beach in order to determine if residual contamination exists as a result of Munitions and Explosives of Concerns (MEC) or MEC-related removal activities.

Results from this sampling event indicate that no semivolatile or explosive compounds of concern relating to MEC or MEC-related activities are present at Buckroe Beach. Trace metals are present at concentrations either below screening criteria or within the range of accepted natural background concentrations.

*Final Report, Environmental Sampling
Buckroe Beach, Hampton, Virginia
July 2004*

Sample Location	Actual Sample Depth (inches bgs ¹)	Description	Anomaly	Depth to MEC ² (inches bgs)	
1	24-30	Subsurface	Ordnance related scrap, projectile, 75 mm, MK1 shrapnel round, empty	24	Dec 2003
2	12-18	Subsurface	Ordnance related scrap, projectile, 75 mm, MK1 shrapnel round, empty	12	Dec 2003
3	24-30	Subsurface	Ordnance related scrap, projectile, 75 mm, MK1 shrapnel round, empty	24	Dec 2003
4	24-26	Subsurface	OE, projectile, 76mm, projectile, practice, M42B2 round	24	Dec 2003
5	10-16	Subsurface	Ordnance related scrap, projectile, 75 mm, MK1 shrapnel round, empty	10	Dec 2003
6	0-6	Surface	Ordnance related scrap, projectile, 75 mm, MK1 shrapnel round, empty	12	Dec 2003
7	18-24	Subsurface	Ordnance related scrap, projectile, 75 mm, MK1 shrapnel round, functioned as designed	18	Dec 2003
8	0-6	Surface	75 mm, 40 mm	Unknown	Spring 2003
9	18-24	Subsurface	75 mm	Unknown	Spring 2003
10	18-24	Subsurface	MEC type unknown	Unknown	1998-2002
11	0-14	-	South Disposal Area	Disposal Depth +2 ³	-
12	0-14	-	North Disposal Area	Disposal Depth +2	-
13	0-6	Surface	OE, projectile, 76mm, projectile, practice, M42B2 round	18	Dec 2003

Typical Munitions Discovered in Buckroe Beach

- 1 bgs - below ground surface
 2 The depth at which MEC was originally discovered.
 3 14-inch depth equals the depth at which the MEC was placed prior to detonation plus 2 inches. The disposal areas were used during the December 2003 removal operation



Figure 3- Locations of Recovered MEC

**End of Buckroe Beach FUDS
Decision Document**