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FINAL NON TIME CRITICAL REMOVAL ACTION WORK PLAN UNEXPLODED ORDANCE 16
(UXO 16) ADJACENT TO CAYO LA CHIVA ATLANTIC FLEET WEAPONS TRAINING AREA
FORMER VIEQUES NAVAL TRAINING RANGE VIEQUES ISLAND PUERTO RICO

10/01/2016
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Final

**UXO 16 Adjacent to Cayo la Chiva
Non-Time-Critical Removal Action
Work Plan**

**Atlantic Fleet Weapons Training Area – Vieques
Former Vieques Naval Training Range
Vieques, Puerto Rico**

Contract Task Order 019

October 2016

Prepared for

**Department of the Navy
Naval Facilities Engineering Command
Atlantic**

Under the

**NAVFAC CLEAN Program
Contract N62470-11-D-8012**

Prepared by



Virginia Beach, Virginia

Executive Summary

This Work Plan presents the approach for a Non-Time-Critical Removal Action (NTCRA) to reduce the explosive hazard associated with nine potential munitions and explosives of concern (MEC)/material potentially presenting an explosive hazard (MPPEH) items identified immediately offshore of Cayo la Chiva in UXO 16, located at the former Vieques Naval Training Range (VNTR), Vieques, Puerto Rico (**Figures ES-1 and ES-2**). Cayo la Chiva is located in close proximity to Playa la Chiva (Blue Beach), a beach that is currently open to the general public for recreational use (see **Figure ES-2**). This NTCRA will ultimately support the final remedy selection for the site via the full Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process.

The NTCRA approach described in this work plan was jointly developed by the Naval Facilities Engineering Command (NAVFAC) Atlantic, the Environmental Protection Agency (EPA) Region 2, the Commonwealth of Puerto Rico Environmental Quality Board (PREQB), the Commonwealth of Puerto Rico Department of Natural and Environmental Resources (PRDNER), and the United States Fish and Wildlife Service (USFWS). NAVFAC, EPA, PREQB, PRDNER, and USFWS work jointly as the Vieques Environmental Restoration Program (ERP) Technical Subcommittee. In addition, because UXO 16 includes offshore areas of Vieques, this NTCRA includes coordination with the National Marine Fisheries Service (NMFS).

The NTCRA activities will include a team of munitions response and scientific divers to locate and assess the nine potential MEC/MPPEH and surrounding underwater environment, removal of each potential MEC/MPPEH while minimizing potential impacts to the natural environment to the greatest extent practicable, and transport of each item to an approved disposal area for destruction on the former VNTR. In the unlikely event removal of the item is not possible, encapsulation of the item will be considered and additional work planning will be conducted and submitted as an addendum to this Work Plan.

Resumen Ejecutivo

Este Plan de Trabajo presenta el enfoque para una acción de tiempo no crítico (NTCRA, por sus siglas en inglés) para reducir el peligro de explosión asociado con nueve municiones y explosivos de preocupación (MEC, por sus siglas en inglés) potenciales/artículos con material que potencialmente podría presentar un peligro de explosión (MPPEH, por sus siglas en inglés) que se identificaron cerca de la orilla de Cayo la Chiva en UXO 16, localizado en el antiguo Campo de Adiestramiento Naval de Vieques (VNTR, por sus siglas en inglés), Vieques, Puerto Rico (**Figuras ES-1 y ES-2**). Cayo la Chiva está localizado muy cerca de la Playa la Chiva (Blue Beach), una playa que actualmente está abierta al público en general para uso recreativo (ver **Figura ES-2**). En última instancia, esta NTCRA ayudará a la selección del remedio final para el sitio siguiendo el proceso de la Ley de Respuesta, Compensación y Responsabilidad Ambiental (CERCLA, por sus siglas en inglés).

El enfoque de la NTCRA que se describe en este plan de trabajo fue desarrollado conjuntamente por el Comando de Ingeniería de Instalaciones Navales (NAVFAC, por sus siglas en inglés) del Atlántico, la Agencia de Protección Ambiental (EPA por sus siglas en inglés) Región 2, la Junta de Calidad Ambiental del Estado Libre Asociado de Puerto Rico (JCA), el Departamento de Recursos Naturales y Ambientales del Estado Libre Asociado de Puerto Rico (DRNA), y el Servicio de Pesca y Vida Silvestre de los EE.UU. (USFWS por sus siglas en inglés). NAVFAC, EPA, la JCA, DRNA y USFWS trabajan conjuntamente como el Subcomité Técnico CERCLA del Programa de Restauración Ambiental (ERP, por sus siglas en inglés) de Vieques. Además, debido a que UXO 16 incluye áreas fuera de las costas de Vieques, esta NTCRA también incluye actividades de coordinación con el Servicio Nacional de Pesca Marina (NMFS, por sus siglas en inglés).

Las actividades NTCRA incluirán el uso de un equipo de respuesta a municiones y buzos científicos para localizar y evaluar los nueve MEC/MPPEH potenciales y el ambiente submarino que les rodean; remoción de cada MEC/MPPEH potencial minimizando los impactos potenciales al ambiente natural en la mayor medida posible, y el transporte de cada artículo a una área de disposición aprobada en el antiguo VNTR para su destrucción. En el improbable caso de que no sea posible remover el artículo, se considerará su encapsulación y se realizarán y someterán planes de trabajo adicionales como un anejo a este plan de trabajo.

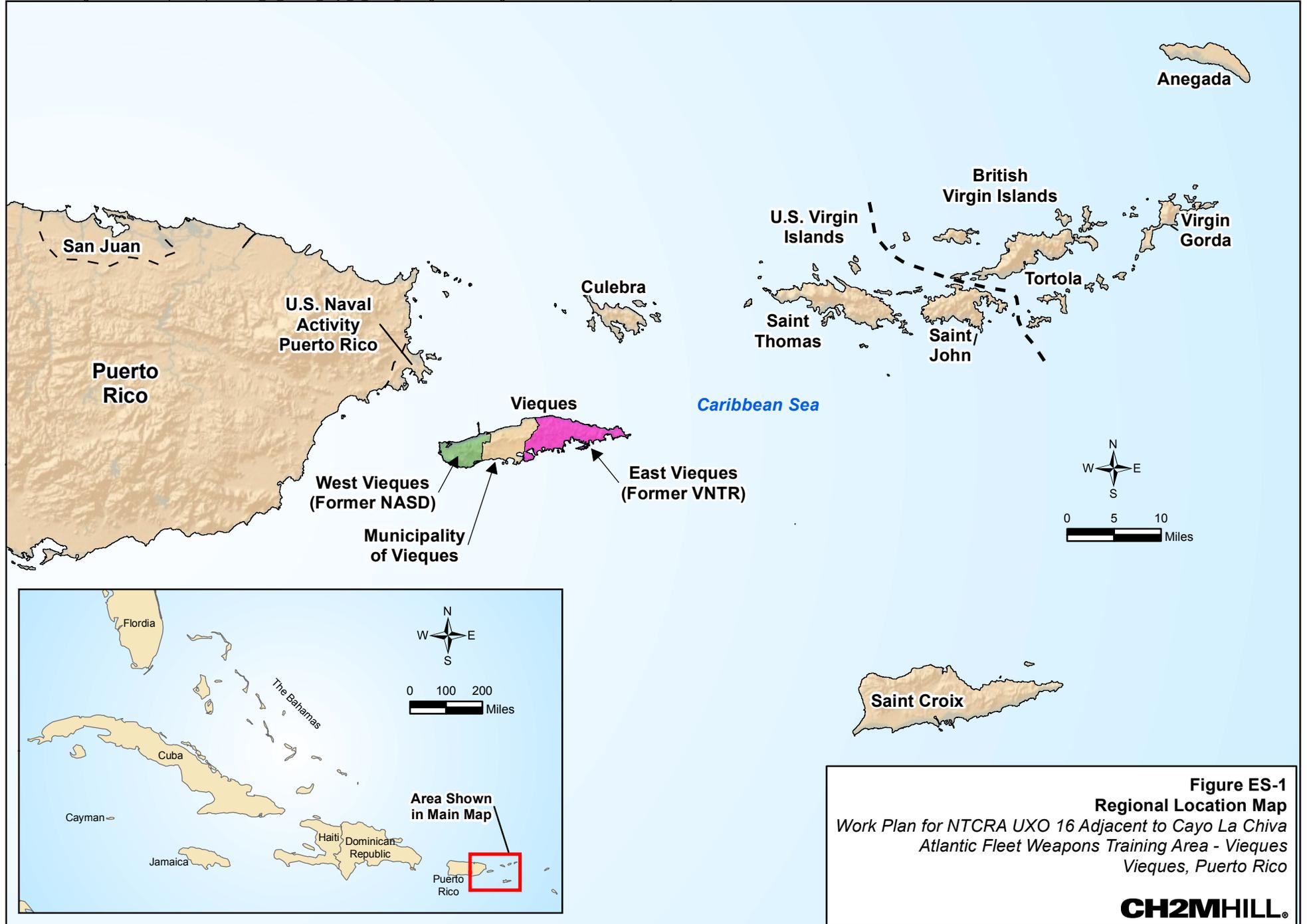
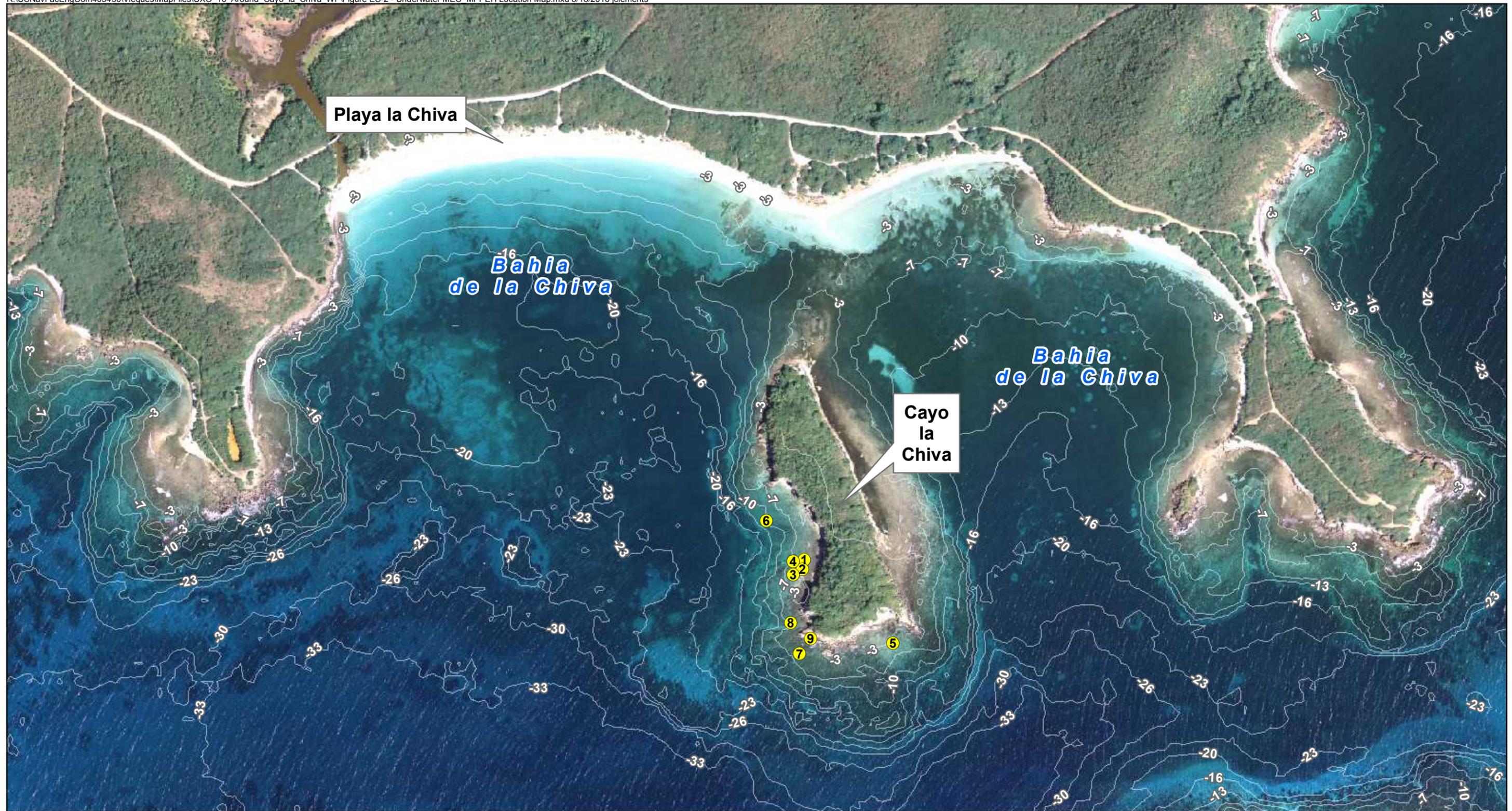


Figure ES-1
Regional Location Map
Work Plan for NTCRA UXO 16 Adjacent to Cayo La Chiva
Atlantic Fleet Weapons Training Area - Vieques
Vieques, Puerto Rico

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Legend

- ① Potential Underwater MEC/MPPEH
- Bathymetry Contour - feet



Figure ES-2
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Work Plan for NTCRA UXO 16 Adjacent to Cayo La Chiva
Atlantic Fleet Weapons Training Area - Vieques
Vieques, Puerto Rico

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Acronyms and Abbreviations

°F	degrees Fahrenheit
BRS	Bomb Recovery System
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CLEAN	Comprehensive Long-term Environmental Action—Navy
CTO	Contract Task Order
DFOW	definable features of work
DMM	discarded military munitions
DOI	Department of the Interior
DQO	data quality objective
DS	Diving Supervisor
EM	Engineering Manual
EMA	Eastern Maneuver Area
EOD	explosive ordnance disposal
EPA	Environmental Protection Agency
ERP	Environmental Restoration Program
ESS	Explosives Safety Submission
EZ	Exclusion Zone
GPS	global positioning system
HSP	Health and Safety Plan
LIA	Live Impact Area
MEC	munitions and explosives of concern
MPPEH	material potentially presenting an explosive hazard
MRS	Munitions Response Site
NAVFAC	Naval Facilities Engineering Command
NAVSEA	Naval Sea Systems Command
Navy	Department of the Navy
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NTCRA	Non-Time-Critical Removal Action
ORCA	Ordnance ReCovery Airbag
PRDNER	Puerto Rico Department of Natural and Environmental Resources
PREQB	Puerto Rico Environmental Quality Board
QA	quality assurance
QC	quality control
ROV	remotely operated vehicle
RRD	range related debris
SCUBA	Self Contained Underwater Breathing Apparatus
SIA	Surface Impact Area
SOP	Standard Operating Procedure
SUXOS	Senior UXO Supervisor

USACE	United States Army Corps of Engineers
USCG	United States Coast Guard
USFWS	United States Fish and Wildlife Service
UXO	unexploded ordnance
UXOQCS	Unexploded Ordnance Quality Control Specialist
UXOSO	Unexploded Ordnance Safety Officer
VNTR	Vieques Naval Training Range

Introduction

This Work Plan presents the approach for a Non-Time-Critical Removal Action (NTCRA) to reduce the explosive hazard associated with nine potential munitions and explosives of concern (MEC)/ material potentially presenting an explosive hazard (MPPEH) items identified immediately offshore of Cayo la Chiva in UXO 16, located at the former Vieques Naval Training Range (VNTR), Vieques, Puerto Rico (**Figures 1-1 through 1-3**).

The Munitions Response Site (MRS) addressed in this Work Plan is an underwater area approximately three acres in size that surrounds Cayo la Chiva, an island approximately 12 acres in size off the southern coast of the VNTR. Cayo la Chiva is located in close proximity to Playa la Chiva (Blue Beach), a beach that is currently open to the general public for recreational use (see **Figure 1-3**). This NTCRA will reduce the explosive hazard in the area associated with the nine items in the near-term, and ultimately support the final remedy selection for the site via the full Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process.

This document was prepared under the Naval Facilities Engineering Command (NAVFAC), Atlantic, Comprehensive Long-term Environmental Action—Department of the Navy (Navy) (CLEAN) 8012 Contract N62470-11-D8012, Contract Task Order (CTO) 19, for submittal to NAVFAC, the Environmental Protection Agency (EPA) Region 2, the Commonwealth of Puerto Rico Environmental Quality Board (PREQB), the Commonwealth of Puerto Rico Department of Natural and Environmental Resources (PRDNER), and the United States Fish and Wildlife Service (USFWS). NAVFAC, EPA, PREQB, PRDNER, and USFWS work jointly as the Vieques Environmental Restoration Program (ERP) Technical Subcommittee. In addition, because UXO 16 includes offshore areas of Vieques, this NTCRA includes coordination with the National Marine Fisheries Service (NMFS).

1.1 Site Background

The only documented military training activity on the island was along the northern portion where a 0.50-caliber machine gun nest fired blank rounds during simulated amphibious landings at Playa la Chiva in 1950. However, fired 5-inch rockets were identified both on and just offshore of Cayo la Chiva, which may have been related to the aforementioned training activities. This NTCRA addresses the nine potential MEC/MPPEH items identified immediately offshore of Cayo la Chiva (see **Figure 1-3**).

1.1.1 Physical Characteristics

Vieques is located in the Caribbean Sea and is the largest island of the Commonwealth of Puerto Rico other than the main island; it is approximately 20 miles long and 4.5 miles wide (see **Figure 1-1**). The former VNTR was transferred to the Department of the Interior (DOI) in 2003 to be operated and managed by the USFWS as a National Wildlife Refuge. The terrestrial areas are currently managed and protected as a wildlife refuge by USFWS and access to the restricted areas is discouraged by fences, dense vegetation, and/or signage. All submerged lands (i.e., all lands beneath the coastal waters) in Puerto Rico are owned by, and under the jurisdiction of, the Commonwealth of Puerto Rico; jurisdiction over submerged lands is administered by PRDNER.

UXO 16 is approximately 11,500 acres in size and includes the underwater areas adjacent to the range and operational areas on East and West Vieques that are known or suspected to have been impacted by MEC (see **Figure 1-2**). Cayo la Chiva (UXO 18) is located adjacent to UXO 16 south of the Eastern Maneuver Area (EMA). It is approximately 12 acres in size and located approximately 1,000 feet south of Blue Beach within Bahia de la Chiva (see **Figure 1-3**). The public currently has access to Bahia de la Chiva and Playa la Chiva (Blue Beach), which are not restricted areas and are popular destinations for recreational activities, such as sunbathing, fishing, boating, swimming, snorkeling, and diving. Cayo la Chiva is a restricted access area but observations indicate it is visited by the public. Warning signs on Cayo la Chiva and warning buoys immediately offshore of Cayo la Chiva are intended to deter use of the island and immediate surrounding waters.

1.1.2 Water Conditions

Anticipated water surface and subsurface conditions consist of the following.

- Water temperatures range from 78 to 81 degrees Fahrenheit (°F) in winter months to 82 to 84 °F in summer months
- The normal tidal range is from 0.5 to 2 feet
- Underwater visibility typically ranges from 15 to 60 feet

The southern side of Vieques is characterized by numerous small inlets and lagoons, an east-west trending reef, and a relatively steep shelf slope drop-off toward the Caribbean Sea between 2 and 5 kilometers from the shoreline. In the area of the nine potential MEC/MPPEH items, water depths are less than 13 feet deep. Water visibility in the area is generally good, but can be affected by sea conditions.

1.1.3 Listed Species and Sensitive Habitats

The National Oceanic and Atmospheric Administration (NOAA) conducted benthic habitat mapping of the waters surrounding Vieques in 2009 (Bauer and Kendall, 2010). Based on this mapping, seagrass and macroalgae are the dominant biological cover types surrounding Cayo la Chiva, with coral making up 10 to 50 percent of the benthic cover immediately west and south of the island (**Figures 1-4 and 1-5**).

The following federally threatened coral species have the potential to occur in the MRS:

- Staghorn coral (*Acropora cervicornis*)
- Elkhorn coral (*Acropora palmata*)
- Pillar coral (*Dendrogyra cylindrus*)
- Lobed star coral (*Orbicella annularis*)
- Mountainous star coral (*Orbicella faveolata*)
- Boulder star coral (*Orbicella franksi*)
- Rough cactus coral (*Mycetophyllia ferox*)

In addition to these federally listed corals, several federally listed sea turtle and marine mammal species have the potential to occur in the MRS. The scalloped hammerhead shark, federally listed as threatened in the central and southwest Atlantic, and the United States distinct population segment of smalltooth sawfish, federally listed as endangered also have the potential to occur in the MRS. The Standard Operating Procedures (SOPs) that will be implemented during the NTCRA for the protection of federally listed species and sensitive habitats are provided as **Attachment A** of this Work Plan.

Although, the above are potential in the MRS, CH2M conducted an underwater reconnaissance in 2015 to each of the nine MEC/MPPEH items to document the benthic habitat types at the items and the nearest colonies of listed and non-listed corals to the items. This information is presented in **Table 1-1**. As indicated in Table 1-1, no listed coral species were observed by CH2M Scientific Divers on or closer than 15 feet from any MEC/MPPEH item in the project area in 2015; the nearest listed corals were observed to be farther than 25 feet from most items.

1.2 Previous Investigations and Nature and Extent of MEC/MPPEH Contamination

The investigations previously conducted in the MRS that are relevant to this NTCRA are discussed in the following subsections.

1.2.1 Navy Explosive Ordnance Disposal Visual Underwater Survey

In 2010, the Navy conducted a visual underwater survey using Navy Explosive Ordnance Disposal (EOD) divers/snorkelers to determine the potential presence of underwater MEC and MPPEH within Bahia de la Chiva. The underwater survey covered the entire area within 30 meters offshore of Cayo la Chiva (approximately 3 acres) and covered the remainder of the bay using 200-foot spacing transects (**Figure 1-6**).

Nine potential MEC/MPPEH items were found just west and south of the island; five MEC items were identified as 5-inch rockets and the other four items were not positively identified but based on their size and shape are potentially also 5-inch rockets.

1.2.2 Cayo la Chiva Site Inspection

In 2011, a site inspection was conducted on Cayo la Chiva to determine if MEC/MPPEH was present on the ground surface of the island. Transects covered approximately five percent of the island; five 5-inch rockets were identified and destroyed. In addition to MEC, range related debris (RRD) including smoke canisters were observed on the ground surface.

1.2.3 Surface and Subsurface Munitions Investigation

In 2013, a surface and subsurface munitions investigation was conducted on and immediately north of Blue Beach. One discarded military munitions (DMM) item (projectile fuze) was identified on the far eastern end of Blue Beach. Several MEC/MPPEH items were also found north of the beach including flares, bulk explosives, small arms cartridges, BDU 33, and a M12 Practice AT Mine with M604 Fuze (CH2M, 2014). All of these items were subsequently removed.

1.2.4 Cayo la Chiva Underwater Reconnaissance Investigation

In 2015, USA Environmental, Inc. (USAE) and CH2M conducted an underwater reconnaissance investigation of the MRS via snorkeling and underwater remotely operated vehicles (ROVs). During this investigation, eight of the nine MEC/MPPEH items previously identified by the Navy in 2010 were located and assessed. One of the items (Item 5) could not be located despite thorough visual and magnetometer inspections at and around the global positioning system (GPS) location identified for the item in 2010. However, as noted in Section 1.2.1, it is possible that some objects identified as potential MEC/MPPEH in 2010 were not actually munitions items. Visual observations made during the 2015 reconnaissance noted how often coral fragments have the approximate size and shape of encrusted munitions and could have been mistaken as munitions. During the reconnaissance investigation, data on the physical conditions, water depths, benthic habitat types, and nearest coral colonies were collected for each item (see **Table 1-1**).

1.3 Evaluation of Risk

MEC/MPPEH in the MRS pose a potential explosive hazard to people that may use the area for swimming, snorkeling, diving, boating, or fishing.

1.4 NTCRA Objectives, Scope, and Organization

1.4.1 Objective

Because the area may be used for swimming, snorkeling, diving, boating, or fishing, the objective of this NTCRA is to reduce the potential explosive hazard associated with nine potential MEC/MPPEH items previously identified offshore of Cayo la Chiva.

1.4.2 Scope and Tasks

The primary tasks under the scope of this NTCRA are outlined below. These tasks are described in greater detail in Section 2.

- Mobilization
- Locate and assess the nine potential MEC/MPPEH items and surrounding underwater environment. Concur on the details of removing each item (see Section 2) and the measures to be taken to minimize potential impacts to the natural environment.
- Remove the nine potential MEC/MPPEH items using the technical approach described in Section 2 with the highest priority placed on human health and safety, while minimizing potential impacts to the natural environment to the greatest extent practicable in accordance with the SOPs presented in **Attachment A**.
- Transport the nine potential MEC/MPPEH items to an approved disposal area within the former VNTR. Destroy the items using the open detonation practices currently followed for terrestrial munitions response activities on Vieques.
- Demobilization
- Reporting

TABLE 1-1

Benthic Habitat Types and Nearest Coral Colonies
NTCRA UXO 16 Adjacent to Cayo la Chiva Work Plan

MEC Item	Latitude	Longitude	Approximate Water Depth	Benthic Habitat Type	Nearest Non-Listed Coral / Distance from Item	Nearest Listed Coral / Distance from Item
1	18° 6'25.20"N	65°23'3.60"W	2 to 4 feet	Colonized pavement	Soft corals (gorgonians) ~ 5 feet from item	None observed within ~ 25 feet of item
2	18° 6'24.70"N	65°23'3.70"W	2 to 4 feet	Colonized pavement	Hard coral (<i>Pseudodiploria strigosa</i>) ~ 10 feet and soft corals (gorgonians) ~ 5 feet from item	At least 12 small colonies of <i>Acropora cervicornis</i> ~ 15 to 20 feet from item
3	18° 6'24.40"N	65°23'4.20"W	2 to 4 feet	Colonized pavement	Soft corals (gorgonians) ~ 5 feet from item	<i>Acropora cervicornis</i> ~ 30 feet from item
4	18° 6'25.10"N	65°23'4.20"W	2 to 4 feet	Colonized pavement	Soft corals (gorgonians) ~ 5 feet from item	None observed within ~ 25 feet of item
5 ^a	18° 6'20.90"N	65°22'58.70"W	6 feet	Colonized pavement	Soft corals (gorgonians) ~ 5 feet from item	None observed within ~ 25 feet of item
6	18° 6'27.20"N	65°23'5.70"W	10 feet	Colonized pavement	Soft corals (gorgonians) ~ 10 feet from item	None observed within ~ 25 feet of item
7	18° 6'20.30"N	65°23'3.80"W	6 feet	Colonized pavement	Hard coral (<i>Pseudodiploria strigosa</i>) ~ 15 feet and soft corals (gorgonians) ~ 2 feet from item	<i>Acropora palmata</i> ~ 15 feet from item
8	18° 6'21.90"N	65°23'4.30"W	7 feet	Colonized pavement	Soft corals (gorgonians) ~ 10 feet from item	None observed within ~ 25 feet of item
9	18° 6'21.10"N	65°23'3.20"W	5 feet	Colonized pavement	Hard coral (<i>Montastrea cavernosa</i> , <i>Pseudodiploria clivosa</i>), and soft corals (gorgonians) ~ 1 to 2 feet from item	<i>Acropora palmata</i> ~ 25 feet from item

Data based on the GPS location and not the item itself.

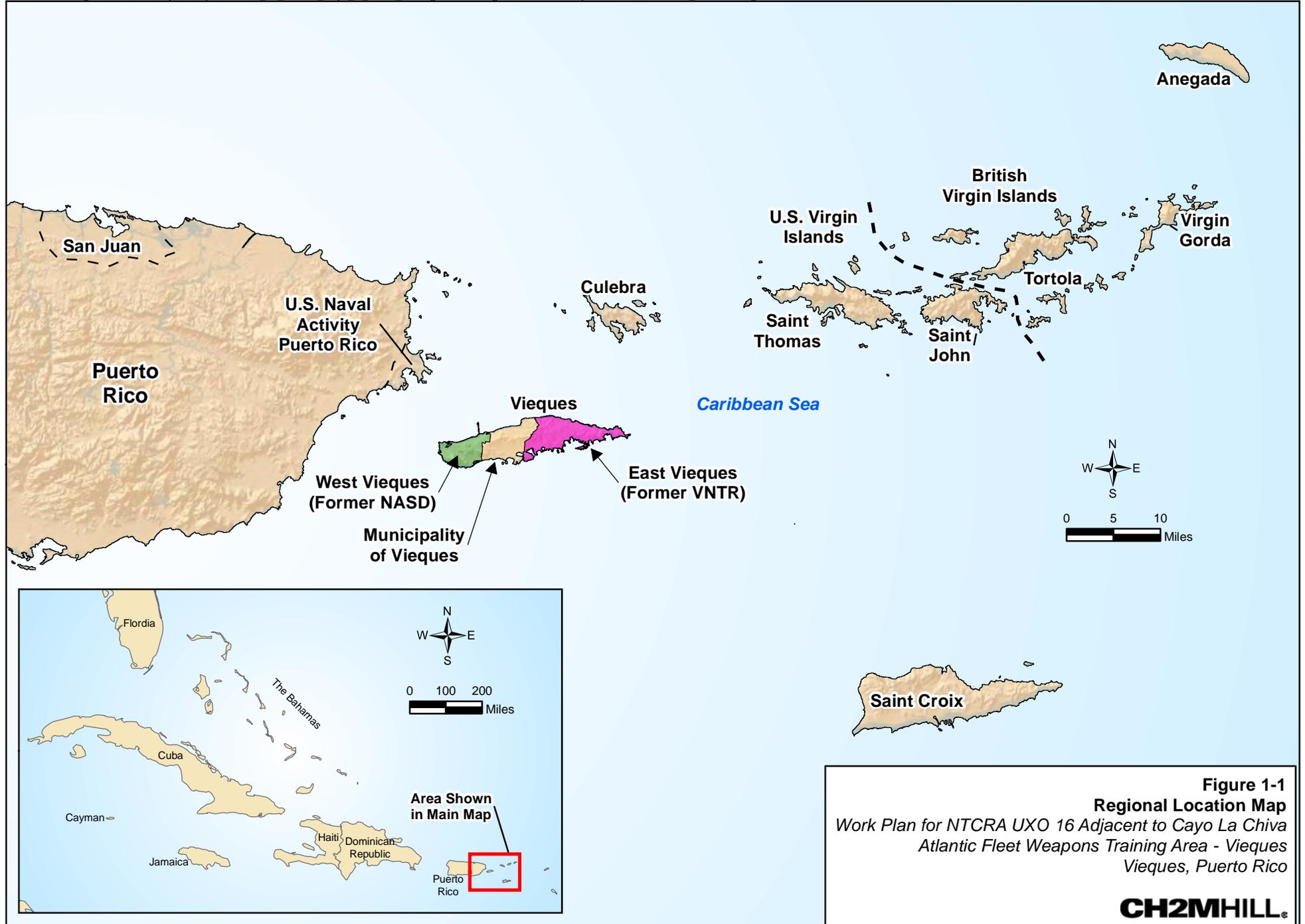
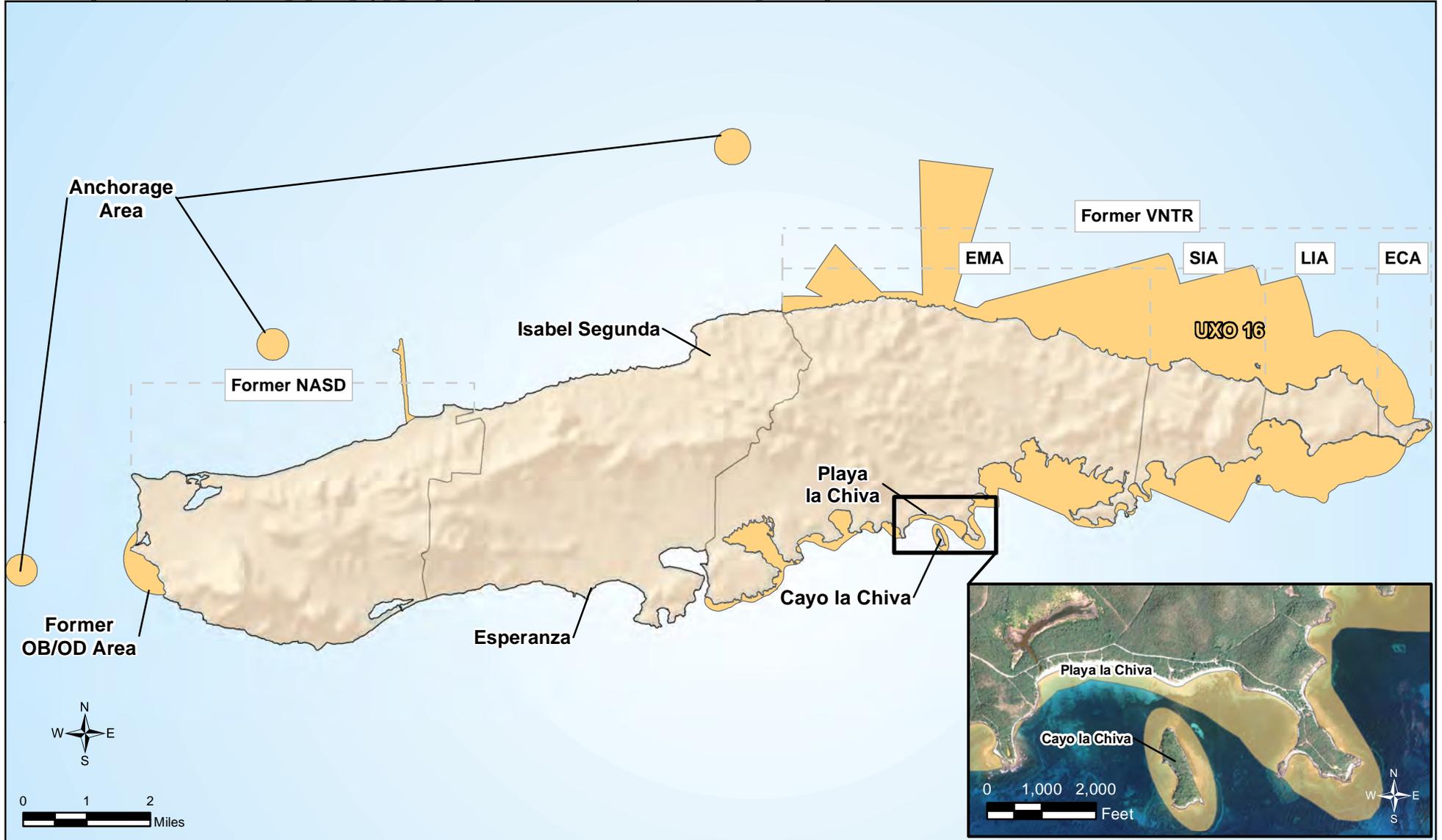


Figure 1-1
Regional Location Map
Work Plan for NTCRA UXO 16 Adjacent to Cayo La Chiva
Atlantic Fleet Weapons Training Area - Vieques
Vieques, Puerto Rico

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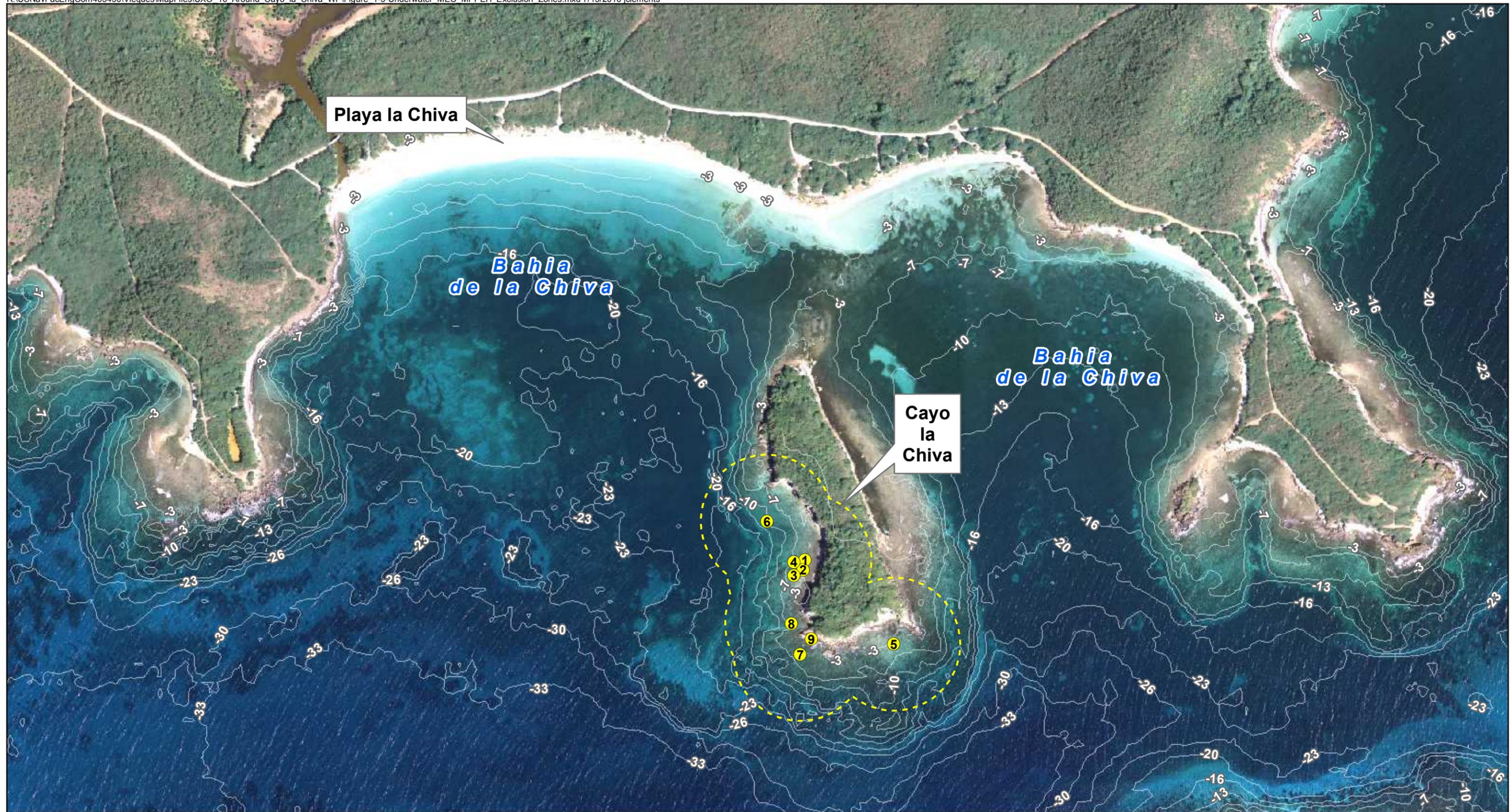


Legend

UXO 16

- ECA - Eastern Conservation Area
- EMA - Eastern Maneuver Area
- LIA - Live Impact Area
- SIA - Surface Impact Area
- NASD - Naval Ammunition Support Detachment
- VNTR - Vieques Naval Training Range

Figure 1-2
UXO 16 Location Map
 Work Plan for NTCRA UXO 16 Adjacent to Cayo La Chiva
 Atlantic Fleet Weapons Training Area - Vieques
 Vieques, Puerto Rico



Legend

- Potential Underwater MEC/MPPEH
- Bathymetry Contour - feet
- Exclusion Zones - 349 ft



Figure 1-3
Underwater MEC/MPPEH Exclusion Zones
 Work Plan for NTCRA UXO 16 Adjacent to Cayo La Chiva
 Atlantic Fleet Weapons Training Area - Vieques
 Vieques, Puerto Rico



Legend

① Potential Underwater MEC/MPPEH

UXO 16

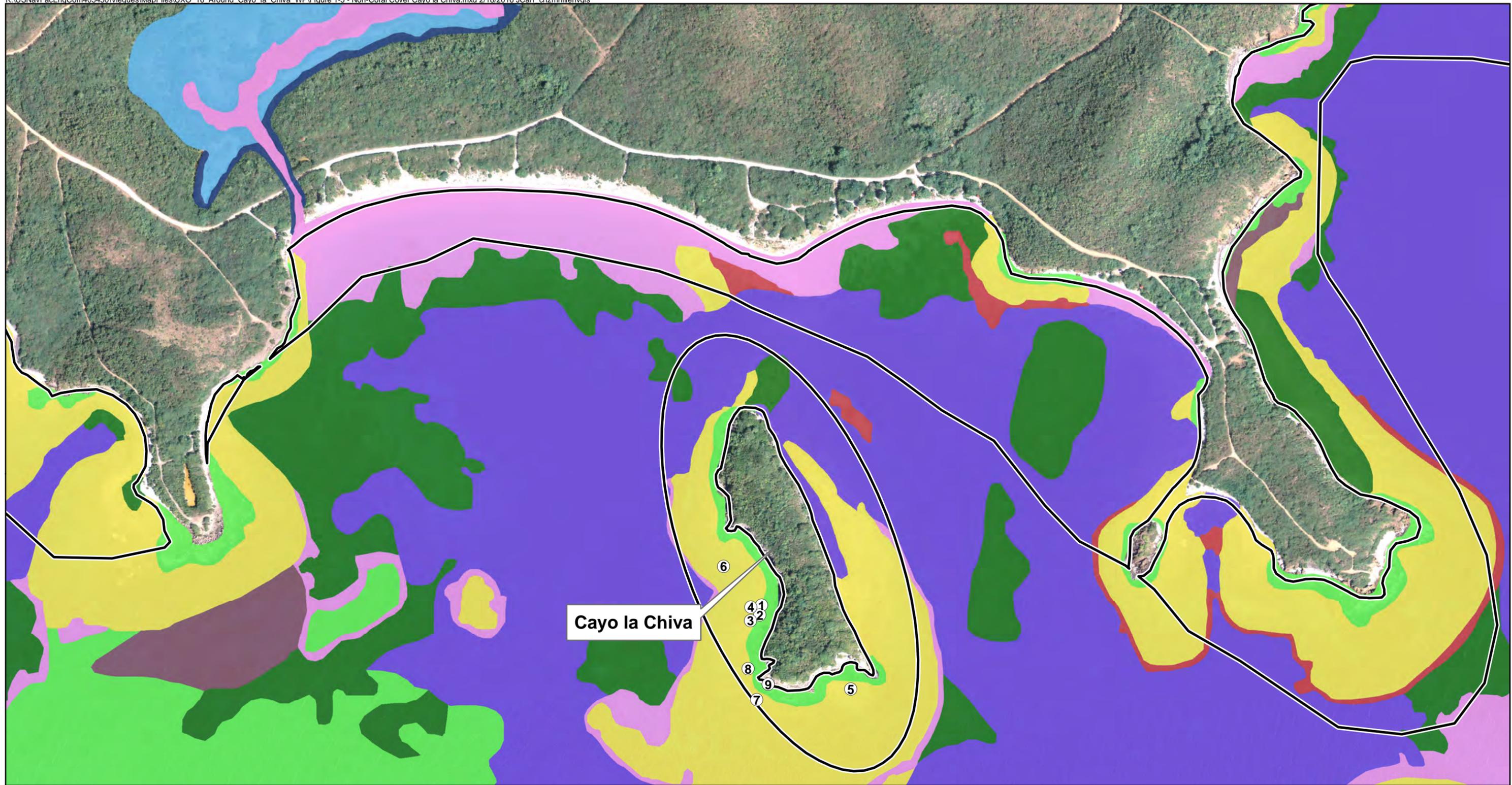
Percent Coral Cover (Bauer and Kendall, 2008)

0% - <10%

10% - <50%



**Figure 1-4
Coral Cover**
*Work Plan for NTCRA UXO 16 Adjacent to Cayo La Chiva
Atlantic Fleet Weapons Training Area - Vieques
Vieques, Puerto Rico*



Cayo la Chiva

6
4
1
3
2
8
9
7
5

Legend

① Potential Underwater MEC/MPPEH

UXO 16

Non-Coral Biological Cover (Bauer and Kendall, 2008)

Algae 10% - <50%
Algae 50% - <90%

Algae 90% - 100%
Mangrove 10% - <50%
Mangrove 50% - <90%
No Cover 90% - 100%

Seagrass 10% - <50%
Seagrass 50% - <90%
Seagrass 90% - 100%
Unknown



0 500 1,000 Feet

Figure 1-5
Non-Coral Biological Cover
Work Plan for NTCRA UXO 16 Adjacent to Cayo La Chiva
Atlantic Fleet Weapons Training Area - Vieques
Vieques, Puerto Rico



Legend

- ① Potential Underwater MEC/MPPEH
- Nearshore Survey
- Transect Inspections (approx. 200 ft spacing)



Figure 1-6
2010 EOD Underwater Visual Survey Area
Work Plan for NTCRA UXO 16 Adjacent to Cayo La Chiva
Atlantic Fleet Weapons Training Area - Vieques
Vieques, Puerto Rico

Technical Management Plan

This section identifies the approach, methods, and operational procedures to be implemented during the NTCRA.

2.1 Technical Approach

The technical approach, including the methods and operational procedures that will be implemented for this NTCRA are described below. The project team will consist of USAE personnel, who will be responsible for conducting all underwater and terrestrial munitions removal/disposal operations (including quality control [QC]), and CH2M personnel, who will be responsible for assessing USAE adherence to the **Attachment A** SOPs and performing quality assurance (QA) activities.

All operations conducted by the project team for this NTCRA will be in accordance with this Work Plan and the following documents:

- Explosives Safety Submission (ESS) prepared for the project (CH2M, 2016b)
- Section 30 of U.S. Army Corps of Engineers (USACE) Engineering Manual (EM) 385-1-1, Safety and Health Requirements, dated November 30, 2014 (USACE, 2014)
- CH2M's Health and Safety Plan (HSP) (CH2M, 2016a)
- USAE's HSP (USAE, 2016)

Prior to the commencement of underwater munitions operations, a request for a Notice to Mariners will be filed with the United States Coast Guard (USCG) to alert the public of the operations. Divers and snorkelers will operate from a designated dive boat. One or more additional vessels will provide ancillary support during operations, including a security boat which will patrol the area to stop boats from entering the Exclusion Zone (EZ) or to notify the dive boat to cease operations until the EZ is clear. Determination and control of EZs are discussed in the ESS prepared for the project (CH2M, 2016b).

2.1.1 Mobilization

Mobilization activities will include the following:

- Transport project personnel and ship equipment to project site
- Assemble, inspect, and test field equipment
- Set up support facilities and communication systems
- Initiate coordination with the USCG, decompression chamber, hospital, and other emergency responders
- Conduct pre-task briefing/activity hazard analysis for dive team and boat crew, including review of video and photograph logs taken during the 2010 and 2015 reconnaissance

2.1.2 Assess MEC/MPPEH Items and Surrounding Underwater Environment

Under this task, the project team will locate and assess the nine potential MEC/MPPEH items and surrounding underwater environment. The potential MEC/MPPEH items will be located based on the GPS locations identified by the Navy for the items in 2010 and re-acquired in 2015 (see **Table 1-1** and Section 1.2.4). Each GPS location will first be marked with a marker float (small sandbag with a line and pelican float, or equivalent) placed in the water from the surface. USAE Unexploded Ordnance (UXO) Divers utilizing self-contained underwater breathing apparatus (SCUBA) or snorkel, depending on the water depth, will then conduct a visual circle line search aided by a handheld magnetometer up to approximately 25 feet out from the marker float in all directions to locate

the item. Once the item is located, the UXO Divers will mark the exact location of the item with a marker float and will conduct an initial assessment of the type, fuzing, and level of encrustation of the item. Underwater ROVs may be used to support diving operations under this and other tasks. Underwater operations will be documented by underwater video and/or photographs.

After location and initial assessment of each item by the UXO Divers, the UXO Divers will exit the water and discuss their initial assessment with the project team. CH2M Scientific Divers, escorted by UXO Divers will then assess the item and surrounding natural environment. Alternatively, if sufficient information can be gathered by the ROV, it will be used to assess the natural environment at and surrounding the item. Protection of coral species and habitat during diving or ROV operations will be in accordance with the SOP included in **Attachment A**. Photographs will be collected at and immediately around (i.e., the area that could be impacted by the removal) each munitions item prior to munitions removal activities. Following this assessment, the UXO Divers will define the item-specific removal procedure (see Section 2.1.3) with input from the Scientific Divers to maximize worker safety and minimize potential impacts to the natural environment based on the following factors:

- Physical condition of each item
- The type of benthic habitat at each item
- The distance of the nearest colonies of listed and non-listed corals from each item
- Water depth and predominate sea conditions (e.g., wave action) at each item
- Logistical considerations

These factors were preliminarily assessed during the 2015 underwater reconnaissance investigation (see **Table 1-1** and Section 1.2.4); these factors will be reassessed more thoroughly under this task so conditions at the exact date/time of removal can be appropriately considered by the removal team. Based on this assessment, the project team will determine if the item will be removed by hand or removed remotely using a lift bag/balloon or tripod system. These methods are described in detail in Section 2.1.3.

2.1.3 Remove MEC/MPPEH Items

Under this task, UXO personnel will remove each potential MEC/MPPEH item. In the unlikely event removal of the item is determined by the project team to not be possible (e.g., not physically possible, not possible to conduct in accordance with **Attachment A** SOPs, etc.), leaving encapsulation of the item as the only alternative, additional work planning will be conducted and submitted as an addendum to this Work Plan. Observations and information gathered during this field reconnaissance would then be used to prepare the Work Plan addendum.

Each potential removal method is described in detail below. The SOPs that will be implemented during item removal for the protection of federally listed species and sensitive habitats are provided as **Attachment A** of this Work Plan. Photographs will be collected at and immediately around each munitions item following munitions removal activities to help demonstrate the degree of any impact on the surrounding environment caused by the removal.

2.1.3.1 Hand Removal of Items

Items determined to be acceptable to remove by hand will be removed from the seafloor directly by the UXO Divers. The UXO Divers will pick up the item and carry it to the surface or will place the item in a basket, or suitable substitute that will be brought to the surface by topside UXO personnel on the vessel. After the item is transported out of the EZ, CH2M Scientific Divers escorted by UXO Divers will assess the area of the removed item for any potential impacts to listed species. Alternatively, an ROV may be used to evaluate the area for any potential impacts to listed species.

2.1.3.2 Remote Removal of Items

Items determined to not be acceptable to remove by hand will be removed remotely by UXO personnel. Remote removal of an item will involve the use of a lift bag/balloon or tripod system. UXO Divers will attach a bridle or line directly to the item for either method. Floating lines made of polypropylene or suitable substitute will be used to prevent the lines from impacting benthic habitat. A buoy with a line that exceeds the depth of water by 25 percent will be attached directly to each item to help make the location visible to topside personnel.

Lift Bag/Balloon Method

A lift bag/balloon may be used to remotely remove the item from the seafloor under certain conditions. The lift bag/balloon will be Subsalve Bomb Recovery System (BRS)-100, or suitable substitute. A lift bag/balloon may be used, particularly in areas that have 4 foot or greater water depths and no listed coral species within 10 feet of the item. The lift bag/balloon method is considered to have a very low probability of impacting coral located greater than 10 feet from an item in 4 foot or greater water depths (discussed further in **Attachment A**).

The lift bag/balloon will be attached directly to the item or to the attachment line or bridle already in place. A pull line will be attached to the lift bag/balloon or item and used to pull the attached assembly off the seafloor. The pull line will be made of polypropylene or suitable substitute so it floats and, therefore, can be seen on the water surface and does not impact benthic habitat. Once the pull line is attached, the UXO Divers will return to the dive boat and all personnel and vessels will transit to outside the EZ. One of the vessels will pay out the pull line slowly while exiting the EZ. Once outside of the EZ, the Senior Unexploded Ordnance Supervisor (SUXOS)/Diving Supervisor (DS) will take a head count and visually survey the area for other vessels, sea turtles, and marine mammals. After confirmation there is no sign of vessels, sea turtles, or marine mammals inside the EZ, the SUXOS/DS will give the approval to remotely move the item. Any slack in the line will be pulled into the vessel and the pull line will be secured on the vessel's cleat, Sampson post, or suitable substitute. From the vessel, a remote movement will be made using the forward motion of the vessel. Once the item has been remotely lifted off the seafloor, a 5-minute wait time will be observed. Once the 5 minutes have elapsed, the team will return to the item's location, assess the assembly, identify new or potential hazards, and take control of the item. After the item is transported out of the EZ, CH2M Scientific Divers escorted by UXO Divers will assess the area of the removed item for any potential impacts to listed species. Alternatively, an ROV may be used to evaluate the area for any potential impacts to listed species.

In the event that a lift bag/balloon is utilized to remove an item off the seafloor, the process is similar to a terrestrial demolition event. Specifically, it will be inflated after the recommended assessment and photography has occurred, all the divers/snorkelers are out of the water, and when the Dive Supervisor has been given the verbal approval to initiate the actuation device. The Subsalve underwater lifting system that will be utilized has valves that can be actuated manually or remotely from the surface. These systems have been designed, tested and are utilized for extracting UXO items off the seafloor (i.e., BRS-100 and Ordnance ReCovery Airbag (ORCA)).

Tripod Method

A tripod may be used to remotely remove the item from the seafloor, particularly in areas that have 6 foot or less water depths and listed coral species relatively close to the item, but no listed coral species within 3 feet of the item (based on 3 foot width of tripod). The legs of the tripod will be constructed from three pieces of 1.5-inch or larger diameter sturdy material, such as steel or aluminum round pipe, or suitable substitute. The legs of each tripod will have the ability to have weight added to each leg. Weights can be added in 5 or 10-pound increments to keep each leg securely on the seafloor. If necessary, eyebolts (or equivalent) can be added to the tripod legs at the appropriate height above the seafloor so the added weight will not disrupt or harm sea life. The connections will be locked into place using a combination of fittings and fasteners. The tripod will be set up to have an approximately vertical line of pull over the item. It will be secured to the seafloor using sand bags, metal weights, or suitable substitute. The item will be lifted via the pulley on the tripod. The pulley will be operated remotely outside the EZ by using a pull line as described for the lift bag/balloon, or remotely outside the EZ by using a remote control device without a pull line. The tripod system, as noted above to have been

specifically designed for extracting munitions from the seafloor, allows the direction of pull from the vessel to be approximately horizontal while lifting the item vertically off the seafloor.

Once the item has been remotely lifted off the seafloor, a 5-minute wait time will be observed. Once the 5 minutes have elapsed, the team will return to the item's location, assess the assembly, identify new or potential hazards, and take control of the item. After the item is transported out of the EZ, CH2M Scientific Divers escorted by UXO Divers will assess the area of the removed item for any potential impacts to listed species. Alternatively, an ROV may be used to evaluate the area for any potential impacts to listed species.

2.1.4 Transport and Dispose MEC/MPPEH Items

Under this task, the removed MEC/MPPEH items will be transported to an approved disposal area within the former VNTR to be destroyed using the open detonation practices currently followed for terrestrial munitions response activities on Vieques. Prior to MEC being transported, the SUXOS and Unexploded Ordnance Safety Officer (UXOSO) must agree that the risk associated with the movement is acceptable and that the movement is necessary for the efficiency of the activities being conducted or for the protection of people, property, or critical assets. This decision must be documented in writing prior to movement. UXO-qualified personnel may determine that MPPEH is safe to move and no documentation is required.

After taking control of the munitions item(s), each one will be placed in a container (approximately 2-feet by 2-feet by 18-inch plastic container or equivalent) or it will be placed in a small secondary vessel (i.e., dinghy or equivalent) tethered to the main vessel. The munitions item will be covered by a sand bag to keep it in place while transporting. The munitions item will be transported to Playa la Chiva and turned over to USAE personnel, and transported by vehicle to the Surface Impact Area (SIA) or Live Impact Area (LIA).

All recovered MEC/MPPEH will be managed as C/D 1.1. Per the 49 Code of Federal Regulations (CFR): C/D 1.1 represents the Hazard Class and Division of the MEC/MPPEH item being removed from the UXO 16 underwater area adjacent to Cayo la Chiva. The "C" is the Hazard Class and the "D" is the Hazard Division. The "1.1" represents the explosive type with regards to compatibility for labeling, placarding, storage, and transportation. No MEC or MPPEH will be transported to areas other than established MRSs within the VNTR. The material being transported will be secured in a manner to prevent unnecessary movement. The recovered MEC/MPPEH may be transported on board a vessel or in a vehicle. Personnel and equipment involved in the loading, handling, and transportation of MEC/MPPEH shall adhere to the general safety and equipment requirements contained in OP-5 Chapter 10 (NAVSEA, 2015).

2.1.5 Demobilization

Demobilization activities will include the following:

- Inform the USCG, decompression chamber, hospital, and other emergency responders that operations have been completed
- Disassemble, inspect, clean, and conduct post-operation maintenance on field equipment
- Return support facilities and communication systems to pre-operation conditions
- Transport project personnel and ship equipment back to home bases

2.1.6 Reporting

Following completion of field operations, an NTCRA After Action Report will be prepared and submitted to the Vieques CERCLA ERP Technical Subcommittee for review. The report will document the methods used and results of the NTCRA, including observations by divers in and around the nine potential MEC/MPPEH items prior to and following removal. This task also includes compilation and organization of project data, including field notes, GPS data, photographs, videos, and other project-related data.

Quality Control/Quality Assurance Plan

This section presents the QC/QA plan that will be implemented for the NTCRA.

3.1 Quality Control Implementation

QC will be implemented through the establishment of data quality objectives (DQOs) and acceptance criteria, and their monitoring by the contractor's Unexploded Ordnance Quality Control Specialist (UXOQCS). QC will be monitored through definable features of work (DFOW) using a three-phase control process. The DFOWs for this project are divided into activities related to planning, field operations, and reporting and closeout. Planning consists of pre-mobilization activities such as preparation of the various plans required for the project. Field operations include mobilization, location and assessment of MEC/MPPEH items, removal of MEC/MPPEH items, transportation and disposal of MEC/MPPEH items, and demobilization. Reporting and closeout involve preparation of the NTCRA After Action Report, data compilation and organization, and project closeout activities. If a DFOW has not achieved the level of quality established in this QC/QA Plan, work will not proceed until the nonconformance has been corrected or the work will be redone as required by the Plan.

The UXOQCS is responsible for ensuring that the three-phase control process, including the Preparatory Phase, Initial Phase, and Follow-up Phase is implemented for each DFOW defined in this QC/QA Plan. The QC methods and pass/fail criteria are presented in **Table 3-1**.

TABLE 3-1
Quality Control Methods and Pass/Fail Criteria
UXO 16 Adjacent to Cayo la Chiva NTCRA Work Plan

Operation	Standard	Audit	Pass/Fail	Corrective Action
Locate MEC/MPPEH Items	Conforms to Work Plan	UXOQCS daily verifies locations via GPS	Verified GPS location of the item is farther than 10 feet from the GPS location recorded by the removal team	Reacquire the GPS location so the recorded and verified locations are within 10 feet of each other
Instrument validation	Conforms to manufacturer's operating instructions	UXOQCS daily observes instrument/equipment checks	Instruments and equipment must be operable as per the operating manual	Repair or replace defective instruments or equipment
Diving instrument aided visual search	Visual and/or instrument-aided search identifies the item at/near the coordinates reported during the 2010 survey. If MEC/MPPEH is not detected where anticipated, divers commence an instrument-aided circle search from the location reported during the 2010 survey.	UXOQCS daily observes work to validate it is performed properly	Divers do not conduct a 25 foot search and MEC/MPPEH is not discovered	If work is observed that is non-conforming, it must be redone
Data collection	Conforms to Work Plan	UXOQCS daily reviews data collection	Data not collected or not in compliance with approved plans	Data must be corrected or redone as appropriate
MEC/MPPEH management	Conforms to Work Plan and other project plans	100% oversight	Zero deviation from approved plans and procedures	Redo non-conforming work

3.2 Quality Assurance Implementation

QA will be conducted by a designated QA Assessor. For this project, QA assessment will include:

- Ensure that the removal contractor complies with the Work Plan, including SOPs
- Observe/evaluate the removal contractor's UXOQCS audit processes
- Verify that each of the nine potential MEC/MPPEH is effectively located, assessed, removed, transported, and disposed and if not, that this is not due to any quality control failure

SECTION 4

References

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Attachment A
SOPs for Protection of Listed Species and
Sensitive Habitat

Standard Operating Procedures for Protection of Federally Listed Species and Sensitive Habitat

UXO 16 Adjacent to Cayo la Chiva Non-Time-Critical Removal Action

Atlantic Fleet Weapons Training Area – Vieques
Former Vieques Naval Training Range
Vieques, Puerto Rico

August 2016

These Standard Operating Procedures (SOPs) apply to the Non-Time-Critical Removal Action (NTCRA) to be conducted to reduce the explosive hazard associated with nine potential munitions and explosives of concern (MEC)/ material potentially presenting an explosive hazard (MPPEH) items identified immediately offshore of Cayo la Chiva in UXO 16, located at the former Vieques Naval Training Range (VNTR), Vieques, Puerto Rico. The project team will consist of USA Environmental, Inc. (USAE) personnel, who will be responsible for conducting all underwater and terrestrial munitions removal/disposal operations (including quality control [QC]), and CH2M HILL, Inc. (CH2M) personnel, who will be responsible for assessing USAE adherence to these SOPs and performing quality assurance (QA) activities. These SOPs are required to be implemented by all personnel involved in the project field operations, and are required to be posted onboard all work vessels.

Vessel Operations

- All project related watercrafts should travel at no wake speed within shallow waters (10 feet or less) and/or when 150 feet from the coastline.
- All vessels will preferentially follow deep water routes whenever possible.
- Vessel operators will review nautical charts and use onboard depth sounders to prevent vessel contact with the seafloor and coral colonies that extend toward the sea surface.
- If anchoring is necessary, vessels will be anchored preferentially on sandy bottom whenever possible. If anchoring on sandy bottom is not possible, vessels may be anchored on vegetated bottom that consists of seagrass and/or algae (seaweed). Vessels will not be anchored on hardbottom that contains hard and/or soft coral, regardless of the percentage of coral cover present. The type of bottom present will be confirmed by divers, onboard using a glass-bottom bucket, or by other appropriate means, prior to anchoring.
- If the vessel is anchored on vegetated bottom (seagrass/algae), the anchor will be removed from the seafloor in a manner that minimizes disturbance to the vegetation, for example, by attaching a secondary anchor line to the rear of any plow-type anchor (danforth, union, bruce) and pulling the anchor free from the seafloor before lifting to the surface.

Protection of Sea Turtles, Marine Mammals, and Other Federally Listed Species

- All work personnel will be familiar with the identification of federally listed sea turtle, marine mammal, and other species (e.g., scalloped hammerhead shark, smalltooth sawfish) that have the potential to occur in the work areas; Endangered Species Act (ESA) policy and associated civil/criminal penalties for violations; and the procedures to be followed to prevent impacts to sea turtles, marine mammals, and other federally listed species during work activities.

- The following federally listed sea turtle species have the potential to occur in the work areas:
 - Loggerhead sea turtle (*Caretta caretta*)
 - Green sea turtle (*Chelonia mydas*)
 - Leatherback sea turtle (*Dermochelys coriacea*)
 - Hawksbill sea turtle (*Eretmochelys imbricata*)
- The following federally listed marine mammal species have the potential to occur in the work areas:
 - West Indian manatee (*Trichechus manatus*)
 - Humpback whale (*Megaptera novaeangliae*)
 - Sperm whale (*Physeter macrocephalus*)
 - Sei whale (*Balaenoptera borealis*)
 - Blue whale (*Balaenoptera musculus*)
 - Finback whale (*Balaenoptera physalus*)
- Federally listed fish species:
 - Scalloped hammerhead shark (*Sphyrna lewini*)
 - Smalltooth sawfish (*Pristis pectinate*)
- All sightings of the above federally listed sea turtle, marine mammal, and fish species will be documented in a log to be provided to the Navy, National Marine Fisheries Service (NMFS), United States Fish and Wildlife Service (USFWS), and Puerto Rico Department of Natural and Environmental Resources (PRDNER) at the end of the project. The following information shall be collected and recorded in the log for all listed species sightings:
 - Sighted species
 - Date and time of sighting
 - GPS coordinates of sighting location
 - One or more photographs if possible
 - Any action taken to minimize potential impacts to species (see below)
- All personnel onboard work vessels are responsible for observing for the presence of sea turtles, marine mammals, and protected fish species. The work areas will be routinely monitored for the presence of sea turtles, marine mammals, and protected fish species, both underwater and above water.
- If a whale is sighted, maintain a distance of 100 yards or greater between the whale and the vessel whenever possible.
- If a sea turtle, manatee, or protected fish species is sighted, maintain a distance of 50 yards or greater between the animal and the vessel whenever possible.
- If a whale is sighted while a vessel is underway (e.g., bow-riding), attempt to remain parallel to the animal's course. Avoid excessive speed or abrupt changes in direction until the whale has left the area.
- Reduce vessel speed to 10 knots or less when mother/calf pairs, groups, or large assemblages of whales are sighted near an underway vessel, when safety permits. A single whale at the surface may indicate the presence of submerged animals in the vicinity. The vessel should attempt to route around the animals, maintaining a minimum distance of 100 yards whenever possible.
- Sea turtles and marine mammals may surface in unpredictable locations or approach slowly moving vessels. When an animal is sighted in the vessel's path or in close proximity to a moving vessel, reduce speed and shift the engine to neutral. Do not engage the engines until the animal is clear of the area.
- Personnel on work vessels will visually survey the Exclusion Zone (EZ) for the presence of sea turtles, marine mammals, and protected fish species (and vessels) prior to all remote movements of MEC/MPPEH items.

Remote movements of MEC/MPPEH items will be conducted only after confirmation there is no sign of sea turtles, marine mammals, or protected fish species (or vessels) inside the EZ.

- Any collision with and/or injury to a sea turtle, marine mammal, or protected fish species will be reported immediately to NMFS and PRDNER. Work personnel should report sightings of any injured or dead sea turtle, marine mammal, or protected fish species immediately to NMFS, regardless of whether the injury/death is caused by the work personnel.
- Report sea turtles to the NMFS Southeast Regional Office: (727) 824-5312 and to the PRDNER Ranger Corps: (787) 724-5700 or (787) 771-1124.
- Report marine mammals to the Southeast U.S. Stranding Hotline: (877) 433-8299 and the PRDNER Marine Mammal Rescue Program: (787) 645-5593 or (787) 538-4684. Any incidents involving manatees must be reported immediately to the PRDNER Manatee Stranding Coordinator at (787) 645-5593, the USFWS Caribbean Field Office at (787) 851-7297 ext. 220, and to the Vieques National Wildlife Refuge at (787) 741-2138.
- If the injury or death of a sea turtle, marine mammal, or protected fish species is caused by a vessel collision or other work activity, the responsible parties will remain available to assist the respective response personnel as needed.

Protection of Coral and Benthic Habitats

- All work personnel will be familiar with the identification of federally listed coral species, hardbottom habitat, and vegetated bottom habitat that have the potential to occur in the work areas; ESA policy and associated civil/criminal penalties for violations; and the procedures to be followed to prevent impacts to listed coral species, hardbottom habitat, and vegetated bottom habitat during work activities.
- The following general “best diving practices” will be followed:
 - The dive team lead will make sure that underwater conditions (e.g., visibility, current speeds) and weather are suitable for diving to ensure safety of divers and for ability to avoid damaging sensitive underwater habitats.
 - The point of entry and exit will be carefully selected to avoid damaging coral.
 - Divers will make sure that all equipment is well secured before entering in the water.
 - Divers will make sure that they are neutrally buoyant at all times.
 - Contact with coral species described in this SOP shall be avoided.
 - Good finning practice and body control will be followed to avoid accidental contact with coral or stirring up the sediment.
 - Divers will not stand or rest on corals or other sessile benthic invertebrates.
- Divers will limit physical contact with the benthic environment to the minimum extent needed to effectively conduct the work. As standard practice, impacts to any hard or soft coral species shall be avoided to the greatest extent practicable.
- The underwater remotely operated vehicle (ROV) will be operated at a distance from coral or the seafloor such that assessing the potential MEC/MPPEH and surrounding environment can be conducted but contact can be prevented. In addition, the point of entry and exit will be carefully selected to avoid damaging coral.
- Turbidity (sediment suspension) will be minimized to the extent possible during all underwater work activities. Although excessive turbidity is not expected to be generated by the underwater work activities, turbidity will be visually monitored and prudent measures will be taken to minimize turbidity generation.

- The following federally listed coral species have the potential to occur in the work areas:
 - Staghorn coral (*Acropora cervicornis*)
 - Elkhorn coral (*Acropora palmata*)
 - Pillar coral (*Dendrogyra cylindrus*)
 - Lobed star coral (*Orbicella annularis*)
 - Mountainous star coral (*Orbicella faveolata*)
 - Boulder star coral (*Orbicella franksi*)
 - Rough cactus coral (*Mycetophyllia ferox*)

These coral species are federally listed as threatened under the Endangered Species Act. Currently, staghorn and elkhorn corals have “take” prohibitions established, while the other five species may have “take” prohibitions in the future. If any federally listed coral is inadvertently impacted during the NTCRA, whatever activity that caused the impact will be stopped and the following Information will be collected:

- Time, date, and coordinates of the impact
- Name and type of vessel involved, and vessel speed
- A description of the incident (if vessel-related: name, type, and speed of vessel)
- Water depth
- Environmental conditions, including water visibility, waves, and wind speed and direction)
- The coral species impacted and description of the damage

This information will be immediately reported to the National Oceanic and Atmospheric Administration (NOAA) Office of Law Enforcement at (800) 853-1964, NMFS in Boquerón at (787) 851-3700, and PRDNER at (787) 645-5593.

- UXO Divers will determine the most appropriate method for removing an MEC/MPPEH item, with input from the Scientific Divers, and the measures to be taken to minimize potential impacts to the natural environment based on the following factors:
 - Physical condition of each item
 - The type of benthic habitat at each item
 - The distance of the nearest colonies of listed and non-listed corals from each item
 - Water depth and predominate sea conditions (e.g., wave action) at each item
 - Logistical considerations
- No listed coral species were observed by CH2M Scientific Divers on or closer than 15 feet from any MEC/MPPEH item in the project area in 2015; the nearest listed corals were observed to be farther than 25 feet from most items. CH2M Scientific Divers will reassess the locations of listed and non-listed corals relative to the items prior to any movement of the items by the UXO Divers.
- MEC/MPPEH items will be removed from the marine environment by the UXO Divers by hand or remotely by methods that involve use of an air bag/balloon or tripod system, as described in the project Work Plan. Air bags/balloons and tripods will be set up and operated to prevent impacts to the natural environment to the greatest extent practicable. No underwater excavations, drilling, or detonations will be conducted. Floating lines made of polypropylene or suitable substitute will be used to prevent the lines from impacting benthic habitat.

- After each removed MEC/MPPEH item is transported out of the EZ, CH2M Scientific Divers will assess the area of the removed item for any potential impacts to the natural environment.
- The potential for seagrass or coral, particularly listed coral species, to be impacted during removal of the nine potential MEC/MPPEH is very low as the impact avoidance measures identified for the NTCRA will be strictly followed. In the event that seagrass or coral is inadvertently impacted by field operations, the restoration measures identified below will be implemented.
 - Seagrass or non-listed coral species may be relocated by CH2M Scientific Divers prior to item removal as a measure to prevent potential impacts. Relocation of listed coral species prior to item removal has preliminarily been determined to not be needed based on the distances of the nearest listed corals from the items recorded in 2015. CH2M Scientific Divers will reassess the locations of listed corals; however, it is highly unlikely that there will be a need to relocate listed corals prior to item removal.
 - Any seagrass that is inadvertently impacted during the project will be inspected by CH2M Scientific Divers who will determine the type of restoration measures, if necessary, that should be implemented. All seagrass restoration will occur in the area impacted and will be conducted by Scientific Divers who have experience in seagrass restoration techniques. Any void created on the seafloor by an inadvertent impact will be backfilled with adjacent sediment so the grade of the impacted area is flush with the surrounding grade. The methods used to restore seagrass will be specific to the condition of the impacted seagrass and the seagrass species involved. Turtle grass (*Thalassia testudinum*) has deeper rhizomes/roots than shoal grass (*Halodule wrightii*), manatee grass (*Syringodium filiforme*), and paddle grass (*Halophila decipiens*). Divers will attempt to maintain the integrity of the root/rhizome structure of any seagrass that is uprooted or otherwise impacted; the techniques used will depend on the impact condition and species involved. Use of biodegradable stakes to secure replanted seagrass will be evaluated in the field with respect to its suitability based on field conditions.
 - Any hard or soft corals that are inadvertently impacted during the project will be inspected by CH2M Scientific Divers who will determine the type of restoration measures, if necessary, that should be implemented. All coral restoration will be conducted by Scientific Divers who have experience in coral restoration techniques. The overall potential for impacts to coral, especially federally listed coral species, is very low. Restoration measures would primarily involve reattaching any coral that is inadvertently broken. The affected coral would be relocated to a suitable nearby location and reattached onto suitable substrate via cement or marine epoxy using established NOAA methodology. General guidance on coral reattachment is provided in the following two videos:
<http://www.youtube.com/watch?v=XaUttAUHv4> (NOAA, 2009)
<http://www.youtube.com/watch?v=qRlfOu7fERw> (NOAA, 2011)
- If an underwater item that may have historic or archaeological value is encountered, the item will not be disturbed in any way. The item will be photographed, GPS coordinates of the location will be collected, and the Navy will be notified. The Navy will coordinate the collected information with the Puerto Rico State Historic Preservation Office in compliance with the National Historic Preservation Act.

Attachment B
Final Responses to Regulator Comments

**Final Responses to EPA Comments on the
Draft UXO 16 Adjacent to Cayo la Chiva
Non-Time-Critical Removal Action Work Plan
Dated March 2016**

**Atlantic Fleet Weapons Training Area – Vieques
Former Vieques Naval Training Range
Vieques, Puerto Rico**

Presented below are review comments on the *Draft UXO 16 Adjacent to Cayo La Chiva Non-Time Critical Removal Action Work Plan, Atlantic Fleet Weapons Training Area – Vieques, Former Vieques Naval Training Range, Vieques, Puerto Rico*; dated March 2016 (hereinafter referred to as the Draft UXO 16 NTCRA WP).

GENERAL COMMENTS

1. The Draft UXO 16 NTCRA WP refers to the possible use of Remotely Operated Vehicles (ROV) to support diving operations and/or to assess the natural environment surrounding the potential underwater Munitions and Explosives of Concern (MEC)/Material Potentially Presenting an Explosive Hazard (MPPEH) items. The WP does not discuss the precautions that need to be taken while operating ROVs near listed or non-listed coral. For example, the ROV should be kept at a safe distance from any coral to prevent possible damage, and the ROV should never land or rest on the coral. Revise the Draft UXO 16 NTCRA WP to describe the precautions that will be taken to prevent any impact or damage to coral while operating the ROVs.

Navy Response: The SOP in Attachment A (Protection of Listed Species and Sensitive Habitat) has been updated to include use of the ROV. The following has been added as the fourth sentence in the second paragraph of Section 2.1.2: “Protection of coral species and habitat during diving or ROV operations will be in accordance with the SOP included in **Attachment A.**”

A fourth bullet has been added in Attachment A under the Protection of Coral and Benthic Habitats as follows: “The underwater ROV will be operated at a distance from coral or the seafloor such that assessing the potential MEC/MPPEH and surrounding environment can be conducted but contact can be prevented. In addition, the point of entry and exit will be carefully selected to avoid damaging coral.”

2. The Draft UXO 16 NTCRA WP does not mention obtaining a photographic record of each target location and its immediate surroundings (e.g., 4-5 ft diameter) to document the physical conditions before and after removal of the potential underwater MEC/MPPEH items. This information will provide a visual record of the effect(s) of the removal actions on the local habitat and sensitive species. Amend the Draft UXO 16 NTCRA WP (for example, Sections 2.1.2 and 2.1.3) to include taking “before” and “after” pictures of each of the MEC/MPPEH locations.

Navy Response: The following has been added as the fifth sentence in the second paragraph of Section 2.1.2: “Photographs will be collected at and immediately around (i.e., the area that could be impacted by the removal) each munitions item prior to munitions removal activities.” Additionally, the following has been added as the last sentence of Section 2.1.3: “Photographs will be collected at and immediately around each munitions item following munitions removal activities to help demonstrate the degree of any impact on the surrounding environment caused by the removal.” Further, the second sentence in Section 2.1.6 was revised as follows: “The report will document the methods used and results of the NTCRA, including observations by divers in and around the nine potential MEC/MPPEH items prior to and following removal.”

SPECIFIC COMMENTS

1. **Acronyms and Abbreviations, Page iv:** The acronym “ESS” is defined incorrectly. According to DoD 6055.09-M-V8 (Department of Defense Ammunition and Explosives Safety Standards, Volume 8, Glossary), the correct definition is “explosives safety submission.” Correct this definition as noted in the Acronyms and Abbreviations section and in Section 2.1, Technical Approach.

Navy Response: The acronym has been revised as requested.

2. **Section 1.2.3 Surface and Subsurface Munitions Investigation, Page 1-3:** This section notes that “Several MEC/MPPEH items were also found north of the beach including flares, bulk explosives, cartridges, BDU 33, and a practice mine (CH2M HILL, 2014).” It would be helpful in analyzing the hazards presented if the following items were further identified:

- Cartridges – These can generally range in size from 0.22 caliber to 165 millimeters (mm). If the items are small arms cartridges, so state. If they are larger than 0.50 caliber in size, state the specific cartridge or cartridges by type (e.g., 40 mm high explosive, 105 mm illumination).

Navy Response: The text has been revised to indicate small arms cartridges.

- Practice mine – These are of different types, with the M8 practice antipersonnel mine being very dangerous if functioned. State the type and model of the practice mine recovered.

Navy Response: The text has been revised to indicate M12 Practice AT Mine with M604 Fuze.

Revise the section as requested to provide the noted information.

3. **Section 2.1 Technical Approach, last paragraph, Page 2-1:** The text mentions the Exclusion Zone (EZ), but then refers to the project’s explosive safety submission plan for any additional details. To make the Draft UXO 16 NTCRA WP more self-contained, add a paragraph describing the extent of the EZ in relation to the locations of the MEC/MPPEH items. It is also suggested (if feasible/possible) to show the approximate extent of the future EZ around Cayo la Chiva on Figure 1.3.

Navy Response: Consistent with all previous NTCRA work plans on Vieques, the text will refer to the ESS completed as a separate document since the information is not pertinent to achieving the NTCRA objectives. However, Figure 1-3 has been revised to indicate the exclusion zone for each munitions item.

4. **Section 2.1.3.2 Remote Removal of Items, Page 2-3:** The last paragraph of the Lift Bag/Balloon Method subsection states that, “Once the 5 minutes have elapsed, the team will return to the item’s location, assess the assembly, identify new or potential hazards, and take control of the item. After the item is transported out of the EZ [exclusion zone], CH2M scientific divers escorted by UXO divers will assess the area of the removed item for any potential impacts to listed species.” No discussion is provided as to the method(s) by which the item will be “transported out of the EZ.” Revise this subsection to discuss the method(s) by which the item may be transported out of the EZ.

Navy Response: The following has been added as a second paragraph within Section 2.1.4: “After taking control of the munitions item(s), each one will be placed in a container (approximately 2-ft by 2-ft by 18-in plastic container or equivalent) or it will be placed in a small secondary vessel (i.e., dinghy or equivalent) tethered to the main vessel. The munitions item will be covered by a sand bag to keep it in place while transporting. The munitions item will be transported to Playa La Chiva and turned over to USAE personnel, and transported by vehicle to the SIA or LIA.

5. **Section 2.1.3.2 Remote Removal of Items, Page 2-3:** The last paragraph of the Tripod Method subsection states that, “Once the 5 minutes have elapsed, the team will return to the item’s location, assess the assembly, identify new or potential hazards, and take control of the item. After the item is transported out of the EZ [exclusion zone], CH2M scientific divers escorted by UXO divers will assess the area of the removed item for any potential impacts to listed species.” No discussion is provided as to the method(s) by which the

item will be “transported out of the EZ.” Revise this subsection to discuss the method(s) by which the item may be transported out of the EZ.

Navy Response: This comment appears to be a duplicate of Specific Comment #3.

6. **Section 2.1.4 Transport and Dispose MEC/MPPEH Items, Page 2-3:** The first sentence in the second paragraph states that “All recovered MEC/MPPEH will be managed as C/D 1.1.” Expand this statement to define “C/D 1.1” and provide a short discussion of the impact of this determination.

Navy Response: The following has been added after the referenced sentence: “Per the 49 CFR: C/D 1.1 represents the Hazard Class and Division of the MEC/MPPEH item being removed from the UXO 16 underwater area adjacent to Cayo La Chiva. The “C” is the Hazard Class and the “D” is the Hazard Division. The “1.1” represents the explosive type with regards to compatibility for labeling, placarding, storage, and transportation.”

Final Responses to PREQB's Comments on the
Draft UXO 16 Adjacent to Cayo la Chiva
Non-Time-Critical Removal Action Work Plan
Dated March 2016

Atlantic Fleet Weapons Training Area – Vieques
Former Vieques Naval Training Range
Vieques, Puerto Rico

PAGE-SPECIFIC COMMENTS

1. **Page 1-2, Section 1.3 Line 2:** Please provide justification for the conclusive statement that “The potential explosive hazard presented by the MEC/MPPEH to ecological receptors is negligible.”

Navy Response: The sentence referenced in the comment has been removed.

2. **Page 2-1, Section 2.1.2:** Please consider providing a contingency plan in the event that new areas of listed and non-listed coral species growth are discovered within 15 feet of the nine MEC/MPPEH items.

Navy Response: Areas of listed and non-listed coral species are not anticipated to be within 15 feet of the nine MEC/MPPEH based on the 2015 reconnaissance. Munitions removal activities will follow the procedures outlined in Section 2.1.3 and SOPs for protection of federally listed species and sensitive habitat are provided in Attachment A.

**Final Responses to PRDNER Comments on:
UXO 16 Adjacent to Cayo la Chiva, Draft Non-Time-Critical Removal Action (NTCRA) Work Plan
Comments Made by PRDNER on May 12, 2016; Technical Evaluation Conducted July 28, 2016**

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4	1-1	1.1	[Site Background]: There is no documented history of munitions use on or near Cayo la Chiva that would have resulted in MEC being present on or near the island. However, fired 5-inch rockets have been identified both on and offshore of Cayo la Chiva, which indicates the area may have been used for training.	<p>This is incorrect; there is a well-documented history of munitions use on or near Cayo la Chiva. From February 25th through March 11th, 1950, some 80,000 soldiers, sailors, airmen, and Marines participated in Operation PORTREX, centered on Red and Blue beaches; accounts and descriptions of the exercise are available online (e.g., see http://www.valerosos.com/Preludetoinchon.html). The exercise included naval bombardment with (among other munitions) 5-inch rounds; hundreds of landing craft were involved in assaults on Blue and Red beaches, and defensive machine gun emplacements were constructed on “the small island that the map shows about 600 yards off Blue beach, a low and rocky one accessible by rowboat but not by landing craft.” (Quoted from account of Brigadier General Edwin L. Sibert, ground forces commander during Operation PORTREX; see https://www.cia.gov/library/center-for-the-study-of-intelligence/kent-csi/vol4no2/html/v04i2a06p_0001.htm). In addition, defensive tactics employed by ground troops on Vieques included use of a smoke screen to thwart amphibious landings; this is consistent with the recovery of smoke canisters on Cayo la Chiva, as reported in Section 1.2.2.</p> <p>Please revise the text of Section 1.1 to state that Operation PORTREX, a significant joint forces exercise, was conducted in Bahia de la Chiva. Please include discussion / acknowledgment of the central role of Blue Beach and Cayo la Chiva in the</p>	The first sentence was revised as follows: “The only documented military training activity on the island was along the northern portion where a 0.50-caliber machine gun nest fired blank rounds during simulated amphibious landings at Playa La Chiva in 1950.”	Please consider further revising the text to indicate that this same known training exercise may have been / is the likely source of the 5-inch rockets identified on and offshore of Cayo la Chiva. Otherwise, if the second sentence remains as originally written, it gives the false impression that there is no identifiable potential source for the 5-inch rockets.	The following has been added after the revised first sentence: “However, fired 5-inch rockets were identified both on and just offshore of Cayo la Chiva, which may have been related to the aforementioned training activities.”

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				operation, and indicate that the presence of 5-inch rockets and smoke canisters on and/or near Cayo la Chiva is consistent with historical accounts of the operation.			
4	1-1	1.1.1	[Physical Characteristics]: The former VNTR was transferred to the Department of Interior (DOI) in 2003 to be operated and managed by the USFWS as a National Wildlife Refuge. The terrestrial areas are currently managed and protected as a wildlife refuge by USFWS and access to the restricted areas is discouraged by fences, dense vegetation, and/or signage.	Please add the following sentence at the end of this paragraph: All submerged lands (i.e., all lands beneath the coastal waters) in Puerto Rico are owned by, and under the jurisdiction of, the Commonwealth of Puerto Rico; jurisdiction over submerged lands is administered by PRDNER.	The text has been added as requested.	Okay / accepted.	
5	1-2	1.1.3	[Listed Species and Sensitive Habitats]: In addition to these federally listed corals, several federally listed sea turtle and marine mammal species have the potential to occur in the MRS. The Standard Operating Procedures (SOPs) that will be implemented during the NTCRA for the protection of federally listed species and sensitive habitats are provided as Attachment A of this Work Plan.	Please revise the text to include the scalloped hammerhead shark, federally listed as threatened in the central and southwest Atlantic, and the U.S. DPS of smalltooth sawfish, federally listed as endangered.	The text has been revised as requested.	Okay / accepted.	
5	1-2	1.1.3	[Listed Species and Sensitive Habitats]:	Please add the following sentence to the end of this paragraph: However, in addition to federal	Puerto Rico Law 147 contains only	Okay / accepted.	

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			<p>Although, the above are potential in the MRS, CH2M HILL, Inc. (CH2M) conducted an underwater reconnaissance in 2015 to each of the nine MEC/MPPEH items to document the benthic habitat types at the items and the nearest colonies of listed and non-listed corals to the items. This information is presented in Table 1-1. As indicated in Table 1-1, no listed coral species were observed by CH2M scientific divers on or closer than 15 feet from any MEC/MPPEH item in the project area in 2015; the nearest listed corals were observed to be farther than 25 feet from most items.</p>	<p>protection of listed corals, Commonwealth of Puerto Rico Law 147 (Coral Reef Conservation Act of 1999) protects all coral species from damage or take.</p>	<p>administrative requirements and therefore it cannot be included as an ARAR. However, coral and sensitive species and habitats will be protected in accordance with Attachment A. Therefore, no changes to the text are warranted.</p>		
6	1-3	1.2.2	<p>[Cayo la Chiva Site Inspection]: In 2011, a site inspection was conducted on Cayo la Chiva to determine if MEC/MPPEH was present on the ground surface of the island. Transects covered approximately five percent of the island; five 5-inch rockets were identified and destroyed. In addition to MEC, range related debris (RRD) including smoke</p>	<p>Please revise the last sentence to read: "In addition to MEC, range related debris (RRD) including smoke canisters were observed on the ground surface; the presence of smoke canisters is consistent with historical accounts of Operation PORTREX."</p>	<p>Please see the response to the first comment; as a result, no additional text is warranted.</p>	<p>Okay / accepted.</p>	

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			canisters were observed on the ground surface.				
15	2-1	2.1	<p>[Technical Approach]: Prior to the commencement of underwater munitions operations, a request for a Notice to Mariners will be filed with the U.S. Coast Guard to alert the public of the operations. Divers and snorkelers will operate from a designated dive boat. One or more additional vessels will provide ancillary support during operations, including a security boat which will patrol the area to stop boats from entering the Exclusion Zone (EZ) or to notify the dive boat to cease operations until the EZ is clear.</p>	<p>Please revise the text to include / specify provisions for notification of regulators (EPA, USFWS, NMFS, and PRDNER) prior to commencement of underwater munitions operations, with notification to be made sufficiently far in advance to allow regulators to schedule and coordinate observation teams to monitor underwater munitions operations if they so choose.</p> <p>Please clarify in the text whether the additional support vessels will include one or more vessels to accommodate regulator observation teams, and whether Navy / USAE / CH2M will provide such vessel(s).</p>	<p>The requested information is not pertinent to the work plan, but as is the case for all field activities on Vieques, sufficient advance notice is provided so the regulatory agencies can plan their oversight accordingly. If there is room on observation vessels to accommodate regulatory agency representatives, they are welcome to board. However, the Navy will not procure vessels solely to accommodate regulatory observation teams because the regulatory agencies are ultimately responsible for equipment used to conduct their oversight. During the field planning stage, the agencies will be notified of any potential space available on the observation vessels so they can plan accordingly. For clarification, no vessel other than the work vessel and the essential personnel performing the</p>	Okay / accepted.	

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					physical removal activities will be allowed inside the EZ while the removal activities are occurring.		
15	2-1	2.1.1	[Mobilization]: Mobilization activities will include the following: <ul style="list-style-type: none"> • Tansport project personnel and ship equipment to project site 	Please correct the spelling of “Tansport” to “Transport.”	The spelling has been corrected.	Okay / accepted.	
16	2-2	2.1.2	[Assess MEC/MPPEH Items and Surrounding Underwater Environment]: After location and initial assessment of each item by the UXO divers, the UXO divers will exit the water and discuss their initial assessment with the project team. CH2M scientific divers, escorted by UXO divers will then assess the item and surrounding natural environment. Alternatively, if sufficient information can be gathered by the ROV, it will be used to assess the natural environment at and surrounding the item.	Please clarify in the text whether regulator representatives, if present as observers during underwater munitions operations, will be included in discussions of UXO divers’ initial assessment of each item. Also, please clarify whether regulators will be provided with an opportunity to have their own divers / personnel assess each item and the surrounding natural environment if they so choose.	There will be discussions and decisions based on observations throughout the NTCRA that will be made real-time in order to achieve the NTCRA objectives in the most efficient, effective, and safe manner. If regulatory agency representatives are present, they may participate in the discussions, but the removal action will not be stopped to confer with individuals or agencies that are not onsite. With respect to regulatory agency diving, please see the document entitled “Navy Policy on Regulatory Agency Oversight of MRP Dive Operations” that was issued to all Vieques Technical Subcommittee agencies via e-mail from	Okay / accepted.	

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					<p>Dan Waddill on December 7, 2015 and again on April 13, 2016. Further, the Navy feels the objectives of regulatory agency diving stated in the comment can be satisfied by other means. The items and surrounding areas will be photographed so that regulators can see what the item and surrounding environmental conditions are prior to and immediately following removal. This process not only yields a higher degree of safety for all parties, it does not result in potentially significant delays in the NTCRA and the associated logistical challenges.</p>		
16	2-2	2.1.3	<p>[Remove MEC/MPPEH Items]: In the unlikely event removal of the item is determined by the project team to not be possible (e.g., not physically possible, not possible to conduct in accordance with Attachment A SOPs, etc.), leaving encapsulation of the item as the only alternative, additional work planning will be conducted and</p>	<p>Please define / clarify in the text what is meant by “encapsulation of the item,” and provide discussion in the text – perhaps as a new subsection of Section 2.1.3 – of the process for deciding whether encapsulation of a given item is appropriate / acceptable (e.g., who will have input into the decision to encapsulate an item, what factors would limit or preclude the acceptability of encapsulation, etc.). As part of that discussion, please include information on the potential environmental impacts of encapsulation on the benthic habitat, and whether an encapsulation addendum to the Work Plan (if needed) will</p>	<p>If it is determined an item cannot be removed and requires encapsulation, the addendum to this Work Plan will include the details suggested in the comment. Please refer to the EE/CA for UXO 16 Adjacent to Cayo La Chiva regarding encapsulation.</p>	<p>Okay / accepted.</p>	

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			submitted as an addendum to this Work Plan.	include a long-term monitoring component for encapsulated items.			
16	2-2	2.1.3.1	[Hand Removal of Items]: After the item is transported out of the EZ, CH2M scientific divers escorted by UXO divers will assess the area of the removed item for any potential impacts to listed species. Alternatively, an ROV may be used to evaluate the area for any potential impacts to listed species.	Please clarify in the text whether regulators, if present on site during underwater munitions operations, will be provided with an opportunity to have their own divers / personnel assess the area of the removed item for any potential impacts to listed species if they so choose.	Please see the response to the DNER comment on Section 2.1.2.	Okay / accepted.	
17	2-3	2.1.3.2	[Remote Removal of Items]: After the item is transported out of the EZ, CH2M scientific divers escorted by UXO divers will assess the area of the removed item for any potential impacts to listed species. Alternatively, an ROV may be used to evaluate the area for any potential impacts to listed species.	See previous comment.	Please see the response to the previous comment.	Okay / accepted.	
20	3-2	3.2	[Quality Assurance Implementation]: Verify that each of the nine potential MEC/MPPEH is effectively located, assessed, removed, transported, and disposed.	Since one of the nine MEC/MPPEH items could not be found during the 2015 underwater reconnaissance investigation, please add the following text to the end of this sentence: "and if not, that this is not due to any quality control failure."	The requested information has been added.	Okay / accepted.	
23	A-1	Att. A	[Protection of Sea Turtles and Marine Mammals, first bullet]: All work personnel	In accordance with comments above regarding Section 1.1.3 (Listed Species and Sensitive Habitats), please revise the Section Heading to	The requested revision has been made.	Okay / accepted.	

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			will be familiar with the identification of federally listed sea turtle and marine mammal species that have the potential to occur in the work areas; Endangered Species Act (ESA) policy and associated civil/criminal penalties for violations; and the procedures to be followed to prevent impacts to sea turtles and marine mammals during work activities.	read "Protection of Sea Turtles, Marine Mammals and Other Federally Listed Species." Please revise the text of the first bullet to read: "All work personnel will be familiar with the identification of federally listed sea turtle, marine mammal, and other species (e.g., scalloped hammerhead shark, smalltooth sawfish) that have the potential to occur in the work areas; Endangered Species Act (ESA) policy and associated civil/criminal penalties for violations; and the procedures to be followed to prevent impacts to sea turtles, marine mammals and other federally listed species during work activities."	The requested revision has been made.		
24	A-2	Att. A	[Protection of Sea Turtles and Marine Mammals, third bullet]: The following federally listed marine mammal species have the potential to occur in the work areas:	After the bullet listing the federally listed marine mammal species, please add the following new bullet to the text: <ul style="list-style-type: none"> • Federally listed fish species: <ul style="list-style-type: none"> ○ Scalloped hammerhead shark (Sphyrna lewini) ○ Smalltooth sawfish (Pristis pectinata) 	The requested revision has been made.	Okay / accepted.	
24	A-2	Att. A	[Protection of Sea Turtles and Marine Mammals, fourth bullet]: All sightings of the above federally listed sea turtle and marine mammal species will be documented in a log to be provided to the Navy, National Marine Fisheries Service (NMFS), U.S. Fish and Wildlife Service (USFWS), and Puerto Rico Department of Natural and Environmental Resources (DNER) at the end of the project.	Please revise the text to read: "All sightings of the above federally listed sea turtle, marine mammal, and fish species will be documented in a log to be provided...."	The requested revision has been made.	Okay / accepted.	

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24	A-2	Att. A	[Protection of Sea Turtles and Marine Mammals, fifth bullet]: All personnel onboard work vessels are responsible for observing for the presence of sea turtles and marine mammals. The work areas will be routinely monitored for the presence of sea turtles and marine mammals both underwater and above water.	Please revise the text to read: "All personnel onboard work vessels are responsible for observing for the presence of sea turtles, marine mammals, and protected fish species. The work areas will be routinely monitored for the presence of sea turtles, marine mammals, and protected fish species, both underwater and above water.	The requested revision has been made.	Okay / accepted.	
24	A-2	Att. A	[Protection of Sea Turtles and Marine Mammals, seventh bullet]: If a sea turtle or manatee is sighted, maintain a distance of 50 yards or greater between the animal and the vessel whenever possible.	Please revise the text to read: "If a sea turtle, manatee, or protected fish species is sighted, maintain a distance of 50 yards or greater between the animal and the vessel whenever possible."	The requested revision has been made.	Okay / accepted.	
24	A-2	Att. A	[Protection of Sea Turtles and Marine Mammals, eleventh bullet]: Personnel on work vessels will visually survey the Exclusion Zone (EZ) for the presence of sea turtles and marine mammals (and vessels) prior to all remote movements of MEC/MPPEH items. Remote movements of MEC/MPPEH items will be conducted only after confirmation there is no sign of sea turtles or marine	Please revise the text to read: "...will visually survey the Exclusion Zone (EZ) for the presence of sea turtles, marine mammals, and protected fish species (and vessels) prior to all remote movements.... after confirmation there is no sign of sea turtles, marine mammals, or protected fish species (or vessels) inside the EZ."	The requested revision has been made.	Okay / accepted.	

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			mammals (or vessels) inside the EZ.				
24	A-2	Att. A	[Protection of Sea Turtles and Marine Mammals, twelfth bullet]: Any collision with and/or injury to a sea turtle or marine mammal will be reported immediately to NMFS and DNER. Work personnel should report sightings of any injured or dead sea turtle or marine mammal immediately to NMFS, regardless of whether the injury/death is caused by the work personnel.	Please revise the text to read: "Any collision with and/or injury to a sea turtle, marine mammal, or protected fish species will be reported immediately... report sightings of any injured or dead sea turtle, marine mammal, or protected fish species immediately to NMFS..."	The requested revision has been made.	Okay / accepted.	
25	A-3	Att. A	[Protection of Sea Turtles and Marine Mammals, third bullet on page]: If the injury or death of a sea turtle or marine mammal is caused by a vessel collision or other work activity, the responsible parties will remain available to assist the respective response personnel as needed.	Please revise the text to read: "If the injury or death of a sea turtle, marine mammal, or protected fish species is caused by a vessel collision or other work activity..."	The requested revision has been made.	Okay / accepted.	
25	A-3	Att. A	[Protection of Coral and Benthic Habitats]: All work personnel will be familiar with the identification of federally listed coral species, hardbottom habitat, and vegetated bottom habitat that have the potential to occur in the	Please revise the text to read: "All work personnel will be familiar with the identification of federally listed coral species, hardbottom habitat, and vegetated bottom habitat that have the potential to occur in the work areas; ESA policy and associated civil/criminal penalties for violations; Commonwealth of Puerto Rico Law 147 and associated civil/criminal penalties for violations; and the procedures..."	Please see the response to the second DNER comment on Section 1.1.3.	Okay / accepted.	

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			work areas; ESA policy and associated civil/criminal penalties for violations; and the procedures to be followed to prevent impacts to listed coral species, hardbottom habitat, and vegetated bottom habitat during work activities.				
26	A-4	Att. A	[Protection of Coral and Benthic Habitats]: These coral species are federally listed as Threatened under the Endangered Species Act. Currently, staghorn and elkhorn corals have “take” prohibitions established, while the other five species may have “take” prohibitions in the future. If any federally listed coral is inadvertently impacted during the NTCRA, whatever activity that caused the impact will be stopped....	Please revise the text to read: “These coral species are federally listed as Threatened under the Endangered Species Act. Currently, staghorn and elkhorn corals have “take” prohibitions established, while the other five species may have “take” prohibitions in the future. In addition, Commonwealth of Puerto Rico Law 147 imposes “take” prohibitions for all corals. Consequently, if any coral is inadvertently impacted during the NTCRA, whatever activity that caused the impact will be stopped....	Please see the response to the second DNER comment on Section 1.1.3.	Okay / accepted.	
26	A-4	Att. A	[Protection of Coral and Benthic Habitats]: After each removed MEC/MPPEH item is transported out of the EZ, CH2M scientific divers will assess the area of the removed item for any potential impacts to the natural environment.	Please clarify in the text whether regulators, if present on site to monitor operations, will be provided with an opportunity to have their own divers / personnel assess the area of the removed item for any potential impacts to listed species if they so choose. Please describe in the text the type and extent of documentation scientific divers will generate and/or collect in the areas of removed items to provide evidence of impacts to the natural environment (or the lack of such impacts).	With respect to regulatory agency diving, please see the response to the DNER comment on Section 2.1.2. With respect to the type of documentation, the second sentence in Section 2.1.6 was revised as follows: “The report will document the methods used and results	Okay / accepted.	

PDF Pg. #	Doc. Pg. #	Section #	Document Text / Summary of Content [Section Heading, if Applicable, in Brackets]	DNER Comments	Navy Response to Comments (RTCs)	Technical Evaluation of Navy RTCs	Navy Response
					of the NTCRA, including observations by divers in and around the nine potential MEC/MPPEH items prior to and following removal.” As noted previously, text has been added stating photos will be taken before and after each item’s removal.		
26	A-4	Att. A	[Protection of Coral and Benthic Habitats]: Any seagrass that is inadvertently impacted during the project will be inspected by CH2M scientific divers who will determine the type of restoration measures, if necessary, that should be implemented.	<p>Please clarify in the text whether regulators, if present on site to monitor operations, will be provided with an opportunity to have their own divers / personnel inspect, prior to restoration, any area of seagrass that is inadvertently impacted if they so choose.</p> <p>Please describe in the text the type and extent of documentation scientific divers will generate and/or collect in areas of seagrass impacts to provide evidence of those impacts and support decisions and determinations on the need for, and appropriate type of, restoration.</p>	Please see the response to the DNER comment on Section 2.1.2.	Okay / accepted.	
27	A-5	Att. A	[Protection of Coral and Benthic Habitats]: Any hard or soft corals that are inadvertently impacted during the project will be inspected by CH2M scientific divers who will determine the type of restoration measures, if necessary, that should be implemented.	<p>Please clarify in the text whether regulators, if present on site to monitor operations, will be provided with an opportunity to have their own divers / personnel inspect, prior to restoration, any corals that are inadvertently impacted if they so choose.</p> <p>Please describe in the text the type and extent of documentation scientific divers will generate and/or collect in areas of coral impacts to provide evidence of those impacts and support decisions and determinations on the need for, and appropriate type of, restoration.</p>	Please see the response to the same comment made above.	Okay / accepted.	

**Final Responses to USFWS Comments on the
Draft UXO 16 Adjacent to Cayo la Chiva
Non-Time-Critical Removal Action Work Plan
Dated March 2016**

**Atlantic Fleet Weapons Training Area – Vieques
Former Vieques Naval Training Range
Vieques, Puerto Rico**

- 1. Section 2.1.2, Assess MEC/MPPEH Items Surrounding Underwater Environment, page 2- 1:** The document states that the nine potential MEC/MPPEH items identified and investigated in 2010 and 2015 will be located using a GPS, coordinates of their last known general location, and a handheld magnetometer. Once re-acquired, the assessment and removal activities will begin. Given the length of time since the 2015 investigation and the potential for the items to move during storm events, it is possible that the items will not be re-acquired. The work plan should include a contingency if this were to occur.

Navy Response: A contingency for locating the items is included in the next paragraph; it states: “The diver will complete a search of the bottom utilizing a circle line search from the marker float. The diver/s will complete a search 25 ft. out from the marker float in all directions. The diver/s will begin sweeping, using a 5-ft sweeping path, with the UW metal detector in order to determine the exact location of the potential items.” It should also be noted that during the initial survey which identified these 9 items an underwater magnetometer was not used and although some shapes identified were positively identified as MEC, others were not. It may be determined during this removal action that some of the items originally identified as potential MEC may resemble shapes consistent with MEC but may actually be naturally occurring material (i.e., coral or rock) that does not have a magnetic signature. In this case, the shape will not be removed.

- 2. Section 2.1.3 .1, Hand Removal of Items, page 2-2:** The document states that impacts to listed species will be assessed following the hand removal of the item. While this should occur, potential impacts or injury to any species and the habitat in general should be assessed. Also, the divers should keep in mind that impacts can include physical disturbance that may happen during the act of separating the item from the substrate, impacts from the repetitive movement of items during tidal cycles or surge, and impacts that may result from exposure to munitions constituents. In any event the area should be photographed prior to and following the removal of the item.

Navy Response: The recommended assessment and photography of the surrounding area prior to removal of each item will be conducted. To that end, the following has been added as the fifth sentence in the second paragraph of Section 2.1.2: “Photographs will be collected at and immediately around (i.e., the area that could be impacted by the removal) each munitions item prior to munitions removal activities.” Additionally, the following has been added as the last sentence of Section 2.1.3: “Photographs will be collected at and immediately around each munitions item following munitions removal activities to help demonstrate the degree of any impact on the surrounding environment caused by the removal.” Further, the second sentence in Section 2.1.6 was revised as follows: “The report will document the methods used and results of the NTCRA, including observations by divers in and around the nine potential MEC/MPPEH items prior to and following removal.”

- 3. Section 2.1 .3.2, Remote Removal of Items, Lift Bag/ Balloon Method, page 2 -3:**

- 1) The document states that a lift bag may be used to remotely remove items from the sea floor. The same precautions and impact documentation approach used for hand removal of items should be used when separating the item from the substrate and attaching it to the lift bag.

Navy Response: Please see the response to USFWS Comment #2.

2) To lift the item from the sea floor, the lift bag needs to be inflated with sufficient air to make it positively buoyant. Please clarify when in the process will this occur and how the bag be inflated remotely.

Navy Response: The following information has been added to Section 2.1.3.2: In the event that a lift bag/balloon is utilized to remove an item off the sea floor, the process is similar to a terrestrial demolition event. Specifically, it will be inflated after the recommended assessment and photography has occurred, all the divers/snorkelers are out of the water, and when the Dive Supervisor has been given the verbal approval to initiate the actuation device. The Subsalve UW lifting system that will be utilized has valves that can be actuated manually or remotely from the surface. These systems have been designed, tested and are utilized for extracting UXO items off the sea floor (i.e., Bomb Recovery System-100 (BRS) and Ordnance Recovery Airbag (ORCA)).

3) The document states that a lift bag will be use to remotely remove an item from the sea floor. When a lift bag is used to move an item from the sea floor to the surface, the bag must be inflated with an amount of air sufficient make the item positively buoyant. When this occurs on the sea floor, the air placed in the bag is compressed as a function of the depth, and as the bag rises through the water column, the pressure decreases and the volume of air in the bag expands thus increasing buoyancy. This will result in an uncontrolled ascent that will be turbulent and violent if air is not vented from the bag as it and the attached item ascends towards the surface. The document should explain how the air will be remotely vented and the rate of ascent controlled as the lift bag ascends towards the surface.

Navy Response: Please see the response to USFWS Comment #3.2.

4) The document states that a tripod will be constructed over the MEC item anchored to the sea floor, and used to pull the item from the sea floor. The same precautions and impact documentation approach used for hand removal of items should be used when separating the item from the substrate and attaching it to the lift line. Additionally, potential injury to the sea floor from the tripod anchoring system should be similarly assessed and documented. Unless the tripod is anchored to the sea floor with substantial weight and/or intrusive means (e.g., sea screws) it is unclear how the item will be lifted from the sea floor by pulling horizontally on the pull line without toppling over the tripod. Please provide additional detail.

Navy Response: Please see the response to USFWS Comment #2.

The "Tripod Method" paragraph of Section 2.1.3.2 has been revised with the following information: The legs of each tripod will have the ability to have weight added to each leg. Weights can be added in 5 or 10-lb increments to keep each leg securely on the seafloor. If necessary, eyebolts (or equivalent) can be added to the tripod legs at the appropriate height above the seafloor so the added weight will not disrupt or harm sea life.

The tripod system, as noted above to have been specifically designed for extracting munitions from the seafloor, allows the direction of pull from the vessel to be approximately horizontal while lifting the item vertically off the seafloor.