

**ENVIRONMENTAL ASSESSMENT  
AND  
DRAFT FINDING OF NO SIGNIFICANT IMPACT**



**TECHNOLOGY DEMONSTRATION  
OF  
REMOTELY OPERATED UNDERWATER MUNITIONS RECOVERY SYSTEM  
(ROUMRS)  
AND  
ENERGETIC HAZARD DEMILITARIZATION SYSTEM (EHDS)  
AT  
ORDNANCE REEF (SITE HI-06)  
WAI'ANAE, O'AHU, HAWAII**

**Prepared for:**



**DEPARTMENT OF THE ARMY**

**Office of the Assistant Secretary of the Army for Installations, Energy and Environment  
Deputy Assistant Secretary of the Army for Environment, Safety and Occupational Health**

**March 2011**

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**Finding of No Significant Impact for the US Army's  
Technology Demonstrations at Ordnance Reef (Site HI-06), Wai'anae, O'ahu, Hawai'i  
[Remotely Operated Underwater Munitions Recovery System (ROUMRS) and Energetic  
Hazard Demilitarization System (EHDS)]**

**AUTHORITY:** Pursuant to the National Environmental Policy Act (NEPA), as amended (42 USC 4347, Section 102 (2)(C); the implementing regulations issued by the Council on Environmental Quality (CEQ) (40 CFR 1500-1508); and Environmental Analysis of Army Actions (32 CFR 651), the Department of the Army gives notice that an Environmental Assessment (EA) has been prepared for proposed technology demonstrations at Site Hawai'i 06 (HI-06), Ordnance Reef, Wai'anae, O'ahu, Hawai'i. These technology demonstrations will assess the Remotely Operated Underwater Munitions Recovery System (ROUMRS) and Energetic Hazard Demilitarization System (EHDS).

**PROPOSED ACTION:** The Proposed Action (also referred to as the Demonstration) consists of technology demonstrations involving the limited recovery of underwater military munitions (UWMM) and the destruction (demilitarization) of any recovered UWMM using commercially available technologies that have been adapted, including development of new components and procedures, for the recovery and destruction of UWMM. Disposed UWMM are present at HI 06 on the ocean floor in US coastal waters off Wai'anae. The Proposed Action is not an environmental action, but rather a limited (roughly 21-day) demonstration of technologies (ROUMRS and EHDS) designed to evaluate the limited remote recovery of UWMM and the at-sea destruction of any recovered UWMM. These demonstrations will provide the Department of Defense technologies that may be required to address UWMM that are determined to pose an unacceptable risk to human health and the environment, while addressing concerns raised by the state of Hawai'i and local communities about the munitions present.

**ALTERNATIVES CONSIDERED:** The alternatives for the demonstration of newly developed or adapted technologies are limited. The two alternatives considered are the Proposed Action and the No Action Alternative. Although the Proposed Action could be performed at another location, the Demonstration Site (also known as Ordnance Reef or HI-06) was determined to be the only viable location for these demonstrations because the Army possesses extensive knowledge about the munitions present at the HI-06, including the depth and grid coordinates of individual and clusters of munitions. The characteristics (i.e., close-to-shore, shallow water—less than 120 feet, and a hard bottom surface) of the Demonstration Site provide conditions ideal for limiting any potential impact to the environment and ensuring safety. The Army has no other sites where all these conditions exist, therefore, alternative locations were not considered viable.

**SUMMARY OF FINDINGS:** The attached EA evaluated the potential effects of the proposed technology demonstrations (the Demonstration) on environmental resources at Ordnance Reef (HI-06) and the surrounding area. Environmental resources that could potentially be impacted by the Proposed Action that were assessed included: air quality, noise, biological resources, water resources, public health and safety, recreational resources, historic and cultural resources, and socio-economic conditions. Potential impacts of the Proposed Action on these resources are summarized below.

- **Biological Resources:** Sensitive habitat (i.e., coral reef) and protected species can be found within Ordnance Reef (HI-06). Under the Proposed Action, the potential for inadvertent damage to corals exists. However, the Proposed Action, which will be limited in scale and duration, will be guided by recommendations provided by the National Oceanic and Atmospheric Administration based upon pre-surveys of corals and UWMM completed prior to the initiation of the Proposed Action. Based on this guidance, the Proposed Action will not result in permanent or long-term, significant adverse impacts on biological resources.

- Air Quality: Significant adverse impacts to air quality would not occur as a result of the Proposed Action. The Hawai‘i State Department of Health – Clean Air Branch concurs with this determination and has issued an Air Permit Exemption for the Proposed Action.
- Water Quality and Sediments: No significant impacts to marine waters are anticipated as a result of the Proposed Action. The Proposed Action will not involve the discharge of any pollutants, debris, or other materials that might adversely impact water quality and sediments.
- Public Health and Safety: No adverse impacts to public safety and health would occur as a result of the Proposed Action as approved safety measures would be adhered to during all demonstration-related activities. The limited recovery of UWMM would result in potential beneficial impacts as UWMM are often encountered and investigated by recreational divers, and the limited recovery of UWMM from depths of between approximately 30 and 120 feet would reduce the potential human health and safety risks associated with divers moving, disturbing or attempting to recover UWMM as souvenirs, for scrap value or for other purposes.
- Noise Environment: Less than significant, short-term, temporary noise impacts are anticipated during implementation of the Proposed Action. Impacts on both the above-water and underwater noise environments will be reduced by limiting working hours and operational activities to approximately 12 hours per day. Implementation of the Proposed Action will not result in significant long-term adverse noise impacts.
- Historic and Cultural Resources: There will be no impacts to historic properties or cultural resources as a result of the Proposed Action because the Demonstration Site is located more than one mile off-shore in waters between approximately 30 and 120 feet in depth. Pursuant to Section 106 of the National Historic Preservation Act of 1966, as amended, the US Army has received concurrence from the Hawai‘i State Historic Preservation Officer on its determination that the Proposed Action will result in “no historic properties affected”.
- Socio-Economics and Marine Recreational Resources: Socio-economic conditions or marine recreational resources of the area would not be adversely impacted by the Proposed Action. The Wai‘anae community, including ocean users have been actively involved in the development of the Proposed Action and supports its implementation.

DECISION: Based on information compiled and analyzed during preparation of the EA, the US Army finds that the Proposed Action to demonstrate and assess ROUMRS and EHDS would not result in significant adverse impacts on either the man-made or natural environment. Therefore, an environmental impact statement will not be required.

PUBLIC COMMENTS: Comments on this Draft Finding of No Significant Impact must be received within 30 calendar days after its initial publication and shall be directed to:

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The EA addressing the Proposed Action may also be obtained from the above office.

Approved By:

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HERSHELL E. WOLFE  
Acting Deputy Assistant Secretary  
of the Army (Environment, Safety  
and Occupational Health)

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Date

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DEPARTMENT OF THE ARMY

ENVIRONMENTAL ASSESSMENT

AND

DRAFT FINDING OF NO SIGNIFICANT IMPACT

TECHNOLOGY DEMONSTRATION:  
REMOTELY OPERATED UNDERWATER MUNITIONS RECOVERY SYSTEM  
(ROOMRS)

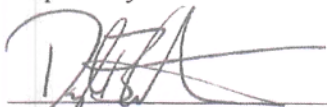
AND

ENERGETIC HAZARD DEMILITARIZATION SYSTEM (EHDS)


AT ORDNANCE REEF (SITE HI-06)  
WAI'ANAЕ, O'AHU, HAWAI'I

March 2011

Prepared by:

  
29 MAR 2011  
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HERSHELL E. WOLFE Date  
Acting Deputy Assistant Secretary  
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## ACRONYMS

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ACHP	Advisory Council on Historic Preservation
AAQS	Ambient Air Quality Standards
ATSDR	Agency for Toxic Substances and Disease Registry
BIP	Blow-in-place
BMP	Best Management Practices
BMPP	Best Management Practices Plan
CAA	Clean Air Act
CAMIP	Coral Avoidance and Minimization of Injury Plan
CBD	Center for Biological Diversity
CCH	City and County of Honolulu
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CO	Carbon monoxide
CFR	Code of Federal Regulations
CWA	Clean Water Act
CZM	Coastal Zone Management
CZMA	Coastal Zone Management Act
DA	Department of the Army
DAR	Division of Aquatic Resources
dB	Decibels
DBEDT	State of Hawaiʻi Department of Business, Economic Development, and Tourism
DDESB	DoD Explosive Safety Board
DENIX	Defense Information Exchange
DERP-FUDS	Defense Environmental Restoration Program – Formerly Used Defense Sites
DHHS	United States Department of Health and Human Services
DLNR	State of Hawaiʻi Department of Land and Natural Resources
DOBOR	Division of Boating and Ocean Recreation
DMM	Discarded Military Munitions
DoD	Department of Defense
DOH	State of Hawaiʻi Department of Health
DSV	Demilitarization Support Vessel
EA	Environmental Assessment
EFH	Essential Fish Habitat
EHDS	Energetic Hazard Demilitarization System
EIS	Environmental Impact Statement
EO	Executive Order
EOD	Explosive Ordnance Disposal
EODD	Explosive Ordnance Disposal Detachment
EPA	Environmental Protection Agency
ESA	Endangered Species Act
ESACC	Expendable Small Arms Cartridge Cases

ESSP	Explosives Safety Site Plan
ESQD	Explosive safety quantity distance
FWCA	Fish Wildlife Coordination Act
GPS	Global positioning system
HAR	Hawai'i Administrative Rules
HRS	Hawai'i Revised Statutes
Hz	Hertz
IUCN	World Conservation Union
kHz	kilo Hertz
LED	Light-emitting diode
MC	Munitions constituents
MCE	Maximum credible event
MDAS	Material Documented as Safe
mm	Millimeter
MMPA	Marine Mammal Protection Act
MPPEH	Materials Potentially Presenting an Explosive Hazard
NEPA	National Environmental Policy Act
NEW	Net explosive weight
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NMFS-PRD	National Marine Fisheries Service – Protected Resources Division
NO <sub>2</sub>	Nitrogen dioxide
NOAA	National Oceanic and Atmospheric Administration
ODASA(ESOH)	Office of the Deputy Assistant Secretary of the Army for Environment, Safety and Occupational Health
O <sub>3</sub>	Ozone
ORCC	Ordnance Reef Community Council
Pb	Lead
PM	Particulate matter
ppb	Parts per billion (by volume)
ppm	Parts per million (by volume)
RCBO	Radiant/Convection Batch Ovens
RCRA	Resource Conservation and Recovery Act
RDX	Cyclotrimethyl-enetrinitramine
RHA	Rivers and Harbors Act
RI	Remedial Investigation
ROT	Remotely operated technology
ROUMRS	Remotely Operated Underwater Munitions Recovery System
ROV	Remotely operated vehicle
RSV	ROV Support Vessel
SAA	Small arms ammunition
SHPO	State Historic Preservation Officer
SHWB	State of Hawai'i Department of Health – Solid and Hazardous Waste Branch
SO <sub>2</sub>	Sulfur dioxide

SPL	Sound Pressure Level
TNT	Trinitrotoluene
$\mu\text{g}/\text{m}^3$	Micrograms per cubic meter of air
$\mu\text{Pa}$	Micro pascal
UH	University of Hawai'i
US	United States
USACE	United States Army Corps of Engineers
USACHPPM	United States Army Center for Health Promotion and Preventative Medicine (now US Army Public Health Command (USAPHC))
USATCES	United States Army Technical Center for Explosives Safety
USC	United States Code
USFWS	United States Fish and Wildlife Service
UWMM	Underwater military munitions
UXO	Unexploded ordnance
WSBH	Waianae Small Boat Harbor
WWTP	Wastewater treatment plant

## 1. Introduction

### 1.1. Scope and Authority

The United States (US) Department of the Army (Army) through its Office of the Deputy Assistant Secretary of the Army for Environment, Safety and Occupational Health (ODASA(ESOH)) has prepared this Environmental Assessment (EA) for a proposed technology demonstration at Site Hawai‘i 06 (HI-06), Ordnance Reef, Wai‘anae, O‘ahu, Hawai‘i. This EA addresses the environmental impacts associated with this Proposed Action (also referred to as the Demonstration) that consists of demonstrations involving the limited recovery of underwater military munitions (UWMM) and destruction (demilitarization) of any recovered UWMM using commercially available technologies that have been adapted, including development of new components and procedures, for the recovery and destruction of UWMM.

The Proposed Action will provide the Department of Defense (DoD) with technologies that may be required to address UWMM that are determined to pose an unacceptable risk to human health and the environment, while addressing concerns raised by the state of Hawai‘i and local communities about the UWMM present at the Demonstration Site (also known as Ordnance Reef (HI-06)). These technology demonstrations will assess the Remotely Operated Underwater Munitions Recovery System (ROUMRS) and Energetic Hazard Demilitarization System (EHDS).

This EA has been prepared pursuant to the National Environmental Policy Act (NEPA) of 1969, 42 US Code (USC), Section 4321 et seq.; the Council on Environmental Quality (CEQ) regulations for implementing NEPA, 40 Code of Federal Regulations (CFR) Parts 1500 – 1508; and the Environmental Analysis of Army Actions (32 CFR 651). These technology demonstrations will be conducted under the Army’s Environmental Quality Technology Program and will be a follow-on to the Army and the Navy Screening Level Survey conducted by the National Oceanic and Atmospheric Administration (NOAA) in 2006.

The intent of this EA is to ensure that comprehensive and systematic consideration is given to potential impacts of the Proposed Action and alternatives on the natural and man-made environment. It is intended to serve as an environmental disclosure document that identifies the purpose and need of the Proposed Action, reasonable alternatives, existing environmental conditions, potential environmental impacts, and mitigation measures to avoid or minimize such impacts, and compensatory mitigation measures, as appropriate.

This EA provides DoD decision makers, state agencies and the public with a complete, objective appraisal of the positive and negative environmental impacts associated with the various Proposed Action activities. The impacts analysis presented in this EA provides the basis to determine whether an Environmental Impact Statement (EIS) or Finding of No Significant Impact is appropriate. The Army NEPA regulations at 32 CFR 651.42(c) state that an EIS is normally required for the 'disposal of ...munitions, explosives, industrial and military chemicals, and other hazardous or toxic substances that have the potential to cause significant environmental impact.' In this case, the Proposed Action is a limited, short term technology

demonstration project that will result in the thermal destruction of explosive compounds. The resulting scrap metal will contain no explosive materials. The activities will be fully permitted under a RCRA research and development permit, as described more fully in this EA, and are not anticipated to cause significant environmental impacts. Accordingly, the Army believes an EIS is not required for the proposed action.

## **1.2. Overview of the Proposed Action**

The Army is proposing to conduct a demonstration project to assess the feasibility of adapting and using a remotely operated technology (ROT) for the recovery of UWMM from the ocean floor, and the remote cutting of recovered munitions and the contained thermal treatment of exposed explosive munitions constituents (MC) compounds on an offshore barge (referred to as the Demilitarization Support Vessel or DSV) within the area of Ordnance Reef (HI-06). The remote cutting coupled with thermal treatment of exposed explosive MC compounds results in the demilitarization and destruction of the recovered munitions. This action is funded by the Army's Research, Development, Test and Evaluation appropriation and supports activities authorized and directed by the National Defense Authorization Act of 2007. The Proposed Action is expected to result in the recovery and disposal of many of the UWMM at Ordnance Reef (HI-06), between the depths of approximately 30 and 120 feet of water.

### **1.2.1. Demonstration Site Location**

The Demonstration Site location, which the DoD identifies as Military Munitions Sea Disposal Site HI-06 (also referred to as Ordnance Reef), is located in near-shore US coastal waters along the western, leeward side of the island of Oʻahu, Hawaiʻi. The nearest Hawaiian towns are Waiʻanae, located approximately three miles to the northeast, and Māʻili, located approximately five miles to the east (NOAA, 2007). Ordnance Reef (HI-06) encompasses an area approximately two nautical miles long in the north-south direction by one nautical mile wide in the east-west direction.

The Demonstration Site encompasses a surface area of approximately 1,695 acres and ranges in depth from 20 feet to approximately 120 feet of water. The northern portion of Ordnance Reef (HI-06) extends into Pōkaʻī Bay to the northeast and just beyond the Waiʻanae Wastewater Treatment Plant (WWTP) sewer outfall to the south. The Demonstration Site was selected for these technology demonstrations because Ordnance Reef (HI-06) is well characterized, its characteristics (e.g., water clarity, range of depths, and variety of unfuzed munitions items) are appropriate for assessing the capabilities of the demonstration technologies, and there is logistical support in the area. The Demonstration Site and surrounding area are shown in Figure 1.

### **1.2.2. Demonstration Site History and Background**

During a benthic survey of the Waiʻanae WWTP sewage outfall in 1992, the City and County of Honolulu (CCH), Department of Wastewater Management's oceanographic team discovered UWMM between 0.3 and 0.6 miles northwest of the existing sewage outfall's





**DEMONSTRATION SITE [Ordnance Reef (HI-06)]**

**FIGURE 1**

diffuser. The UWMM observed between approximately 30 and 120 feet deep were suspected to include clipped .50 caliber small arms ammunition (SAA) and projectiles (possibly 3- to 5-inch naval projectiles) of various types, some between one and three feet in length. The CCH's oceanographic team also discovered UWMM south of the sewage outfall and just west of the Hawai‘i-designated Fish Haven (NOAA, 2007).

In 2002, the DoD tasked the US Army Corps of Engineers (USACE) to conduct a study of Ordnance Reef (HI-06) to determine its eligibility for the Defense Environmental Restoration Program - Formerly Used Defense Site (DERP-FUDS). At the USACE's request, the US Navy's Explosive Ordnance Disposal Detachment (EODD) provided diving and underwater survey support to the USACE's Ordnance Reef Wai‘anae Sewage Outfall project, which was conducted under the DERP-FUDS program. The Navy's EODD surveyed Ordnance Reef (HI-06) and identified roughly 2,000 UWMM, which it categorized as most likely discarded military munitions (DMM). However, Ordnance Reef (HI-06) was determined not to be eligible for a response under the DERP-FUDS program because DoD never owned, leased, otherwise possessed the site, nor did it ever exercise control over it, except to use Ordnance Reef (HI-06) for the disposal of military munitions (ARA, 2010a).

In May 2006, the Army and Navy subsequently funded NOAA to conduct a screening-level survey of the Ordnance Reef (HI-06). The NOAA survey, which was limited to depths of 24 to approximately 300 feet, determined both the boundaries of Ordnance Reef (HI-06) and the locations of UWMM present, provided information for use in identifying the types and approximate quantities of UWMM detected, and analyzed sediment and fish tissue samples for MC (i.e., metals and explosives) (ARA, 2010a; NOAA, 2007). NOAA released its independent report in March 2007. The UWMM present extend from depths of approximately 30 feet to over 300 feet, the maximum depth of the study. Many of the UWMM observed were heavily fouled with algae and benthic organisms. In some cases, munitions were observed with substantial coral growth. The report, which provided the DoD with screening-level data, also provided the basis for assessing the potential explosives safety and human health or environmental risks associated with the UWMM present and for making a determination of whether a response was required.

The Army's and Navy's explosives safety centers concluded that the UWMM present did not pose an immediate explosives safety risk to the public, and only deliberate activities (e.g., divers disturbing UWMM) posed a threat to those who use Ordnance Reef (HI-06) for recreational-related and other activities. The DoD Explosives Safety Board endorsed this conclusion. The Army, as part of its 3Rs (Recognize, Retreat, Report) Explosives Safety Education Program (Recognize—when you have encountered a munition and that munitions are dangerous, Retreat—do not touch, move or disturb it, Report—call 911) implemented a comprehensive public education effort that focused on, but was not limited to, the communities near Ordnance Reef (HI-06) (i.e., Wai‘anae and Nānākuli).

Army's Center for Health Promotion and Preventive Medicine (USACHPPM), now the Army's Public Health Command, and the Navy's Environmental Health Center, the agencies responsible for health and environmental risk assessments, concluded that (a) the contaminant levels from any MC detected were all well below risk-based levels; and (b) the only metals

detected in fish tissue did not appear to be MC associated with the UWMM present at Ordnance Reef (HI-06). Based on available data, these assessors concluded that it was unlikely that the UWMM posed a health risk to humans. The ecological evaluation found no overt signs of stress or ecological impact. However, both agencies concluded that there were data gaps that needed to be addressed to answer the community's questions regarding possible risk to human health and/or the potential contamination of ocean food resources.

The US Department of Health and Human Services' (DHHS), Center for Disease Control, Agency for Toxic Substances and Disease Registry (ATSDR) performed a health consultation for Ordnance Reef (HI-06) based on the NOAA's report. ATSDR, which considers ingestion of biota as the most significant way people could contact chemicals, concluded contact with chemicals (i.e., MC) in sediments would not be of sufficient frequency to present a hazard by ingestion or dermal contact. ATSDR indicated that explosive MC were not detected in fish tissue, and the inorganic chemicals detected in fish tissue are not a public health hazard (ATSDR, 2007).

After review of NOAA's report, DoD (Army) determined that data gaps existed that would need to be addressed to make a definitive determination as to whether the UWMM at Ordnance Reef (HI-06) posed a risk to human health. In December 2007, the Army tasked USACE's Pacific Ocean Division to: (a) work with state agencies and potentially affected communities using its technical project planning process to identify study questions that a follow-on investigation should answer; and (b) determine the steps and information required to close the data gaps and reach a valid answer to those questions. In January 2008, USACE held an initial meeting with the Ordnance Reef Coordinating Council (ORCC) that the Army established, on behalf of the DoD, to review NOAA's survey report and related documents, and to consider courses of action to address community concerns about the UWMM present at Ordnance Reef (HI-06).

The ORCC identified two primary questions.

- Do the UWMM present at Ordnance Reef (HI-06) pose a risk to human health and the environment?
- Is seafood from the area safe to eat?

The Army subsequently obtained assistance from the University of Hawai'i (UH) to conduct sampling (sediment, biota and water column) to answer the community's concerns about whether the fish were safe to eat. In its conduct of this sampling, UH: (a) focused on the NOAA survey study area (Ordnance Reef (HI-06)), including areas up to the shoreline; (b) close data gaps about the human health risk potential posed by the munitions present; and (c) further investigate the site conditions using protocols adapted from those used in the Comprehensive Environmental Response, Compensation, and Liability Act's (CERCLA) Remedial Investigation (RI) process. UH completed its field work, conducting sampling during two timeframes February – March, and August – September 2010. The Army will release UH's report after review in 2011.

### **1.2.3. Military Munitions Present at Ordnance Reef (HI-06)**

The UWMM located during the 2002 and 2006 surveys included, but were not limited to naval gun ammunition, 105 millimeter (mm) and 155 mm artillery projectiles, mines, mortars, and SAA. It is important to note that the UWMM present at Ordnance Reef are categorized as DMM, rather than unexploded ordnance (UXO). The important differences between DMM and UXO are briefly described below:

- DMM are defined as military munitions that have been abandoned without proper disposal or removed from storage in a military magazine or other storage area for the purpose of disposal. The term does not include UXO, military munitions that are being held for future use or planned disposal, or military munitions that have been properly disposed of, consistent with applicable environmental laws and regulations.
- UXO are military munitions that meet each of the criteria below:
  - Have been primed, fuzed, armed, or otherwise prepared for action;
  - Have been fired, dropped, launched, projected, or placed in such a manner as to constitute a hazard to operations, installations, personnel, or material; and
  - Remain unexploded whether by malfunction, design, or any other cause

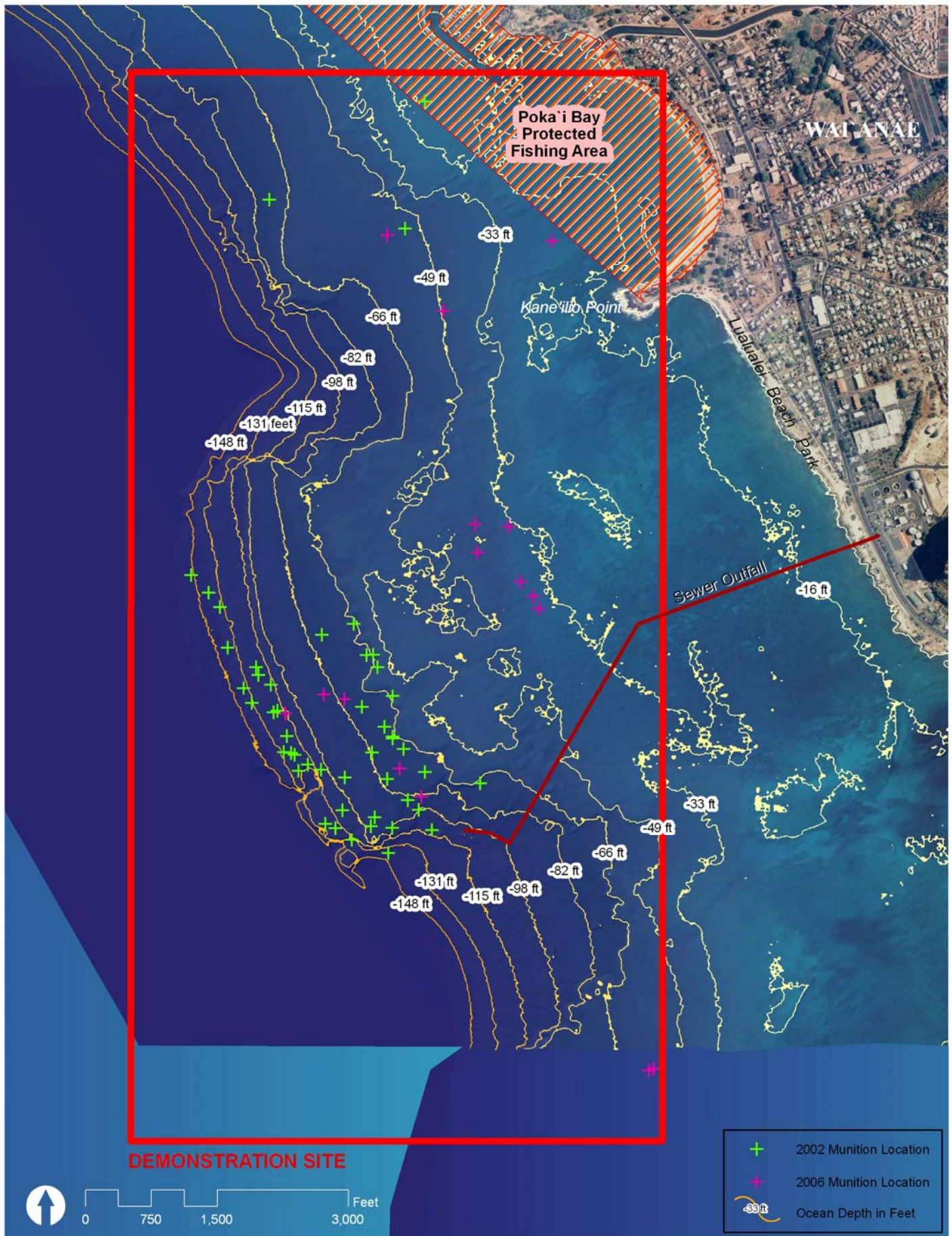
DMM are considered to pose less of an explosives hazard than UXO because such munitions are normally not fuzed, and if fuzed, the fuze has not experienced the arming sequence required for them to function as designed.

The Army, in spite of comprehensive archival research, has not yet found records detailing disposal operations at Ordnance Reef (HI-06). Based on the type of munitions present, the Army believes the munitions were associated with World War II-related activities. Based on research conducted, the UWMM present at Ordnance Reef (HI-06) are expected to contain one or more of the following explosives (explosive MC): trinitrotoluene (TNT), cyclotrimethyl-enetrinitramine (Research Department Explosive or RDX), and/or tetryl, and Explosive D (ammonium picrate) (ARA, 2010a).

When additional DMM are occasionally found at Ordnance Reef (HI-06), their location is documented. The locations and approximate depths of the UWMM present, which were documented during the 2002 and 2006 surveys, are shown in Figure 2, and a listing of these UWMM, sorted by type, size, and location is attached as Appendix A.

The most comprehensive survey of UWMM at Ordnance Reef (HI-06) to date was completed by NOAA in late 2010. Munitions were visually identified and were categorized into three general types: SAA (i.e., ammunition, without projectiles that contain explosives, that is .50 caliber or smaller), small to medium caliber munitions (munitions above .50 caliber to and including 105 mm), and large caliber and other munitions (munitions larger than 105 mm and bombs, rockets, etc.). NOAA estimates 21,200 UWMM within the three Work Areas designated for the Proposed Action. The majority (64 percent) of UWMM documented were comprised of SAA (NOAA, 2011). NOAA's estimate is much higher than previous estimates due to: 1) its divers using NITROX, which provides much greater bottom time, and 2) the ability to take advantage of all previous surveys, which allowed NOAA to focus on areas where munitions





**Military Munitions Present at Ordnance Reef (HI-06)**

EA for Technology Demonstration: ROUMRS and EHDS at Ordnance Reef (HI-06)

**FIGURE 2**

Wai'anae, O'ahu, Hawai'i

were concentrated. In addition to conducting a more exhaustive survey, NOAA estimated its count of UWMM, including SAA, in eaches, rather than by packages, clusters or groupings of munitions. Previous surveys made no attempt to estimate SAA, and addressed packages, clusters and groupings collectively. A summary of UWMM documented by NOAA during their 2010 survey is presented in Table 1-1 below.

**Table 1-1. Summary of UWMM Documented at Ordnance Reef (HI-06)**

	SAA <sup>1</sup>	Medium Munitions <sup>2</sup>	Large Munitions <sup>3</sup>
Work Area A	14	0	0
Work Area B	229	1,461	0
Work Area C	12,557	6,061	874
Total	12,800	7,525	874

Notes:

<sup>1</sup> Ammunition without projectiles that contain explosives, that is .50 caliber or smaller.

<sup>2</sup> Munitions above .50 caliber to 105 mm.

<sup>3</sup> Munitions larger than 105 mm and bombs, rockets, etc.

Source: NOAA, 2011

### 1.3. Public and Agency Involvement

NOAA’s screening level survey (see Section 1.2.2.) provided the DoD a basis for both assessing the potential explosives safety and human health or environmental risks associated with the UWMM present at Ordnance Reef (HI-06) and determining whether a response was required. Based on the explosives safety evaluation, no response was deemed necessary. However, after review of the screening level data, it was determined that data gaps existed that would need to be addressed to make a definitive determination as to whether the UWMM present posed a potential risk to human health or the environment.

As previously indicated, the USACE obtained the services of UH to conduct an investigation to develop information needed to address these data gaps. The Army formed the ORCC, which is composed of representatives from other federal agencies, the state of Hawai‘i, and leaders and community members from communities near Ordnance Reef (HI-06) (i.e., Wai‘anae and Nānākuli). The ORCC has been an active vehicle for public participation, providing a forum for the exchange of information regarding community concerns and activities at Ordnance Reef (HI-06) (ARA, 2010a).

The first ORCC meeting was held in May 2007. ORCC meetings held to date include:

- 25 May 2007 (Hale ‘Ikena, Fort Shafter)
- 18 September 2007 (Hale ‘Ikena, Fort Shafter)
- 31 January 2008 (Pililā‘au Beach Club, Wai‘anae)
- 13 February 2008 (Kapolei Hale)
- 16 April 2008 (JW Marriott Ihilani)
- 29 October 2009 (JW Marriott Ihilani)

- 24 February 2009 (Kapolei Hale)
- 5 August 2009 (Kamehameha Schools Community Learning Center, Nānākuli)
- 2 December 2009 (Pirilā‘au Army Recreation Center)
- 3 June 2010 (Pirilā‘au Army Recreation Center)
- 17 November 2010 (Wai‘anae District Park)

Due to the large geographical area that the Wai‘anae Neighborhood Board represented, it recently split into two Neighborhood Boards to better represent the various constituencies along the leeward coast. The Wai‘anae Coast Neighborhood Board and the newly-formed Nānākuli-Mā‘ili Neighborhood Board are both represented on the ORCC. Joint neighborhood board meetings of the Wai‘anae Coast and Nānākuli-Mā‘ili Neighborhood Boards have been held on October 29, 2008, August 5, 2009, December 3, 2009, and November 18, 2010.

The Army has conducted outreach through various community groups (e.g., churches, civic organizations, schools) and through its presence at community events. Among the information the Army has and continues to distribute are 3Rs Explosives Safety Educational material, Fact Sheets, and both the Defense Information Exchange (DENIX) and USACE websites.

Public involvement activities include surveys, and solicitation of comments, questions, and suggestions. These activities take place at community events, neighborhood meetings, and at educational presentations to various community and/or civic groups. Information gathered is shared with the ORCC to keep them abreast of community issues and concern.

In addition to establishing the ORCC, the Army has taken an inclusive and collaborative approach to addressing UWMM in Hawai‘i. For example, UH and the state’s Department of Land and Natural Resources’ (DLNR) Division of Aquatic Resources (DAR) were involved in NOAA surveys as supporting agencies and continue to be involved with the ongoing investigation. In addition to direct involvement, the Army has also coordinated and consulted with various government agencies and private organizations regarding these technology demonstrations (the Proposed Action).

The ORCC participants including the Wai‘anae and Nānākuli communities; government agencies, both state and federal; and elected officials support the conduct of these technology demonstrations, which will have the added benefit of removing and destroying many of the UWMM present at Ordnance Reef (HI-06).

#### **1.4. Technology Demonstrations – Purpose and Need**

The DoD is faced with the challenge of characterizing locations in US coastal waters where UWMM are present and determining whether, based on site-specific conditions, the UWMM present pose an unacceptable risk to the public. Where UWMM are determined to pose such a threat, the DoD must determine the response needed.

To address the potential need to recover and then dispose of UWMM, while minimizing any risk to human health (including response workers) and the environment, ROUMRS and EHDS (see below) were developed. However, whether these technologies will meet the DoD's requirements for the safe, remote recovery of UWMM and for the destruction of such munitions in an environmentally benign manner that does not increase the potential explosives safety risks (e.g., requiring transport to a designated disposal site through communities) has not been demonstrated.

- ROUMRS was developed by adapting technology typically used in oil exploration operations for use in remotely recovering UWMM.
- EHDS was developed by using a combination of proven conventional munitions destruction technologies adapted to provide for the safe destruction of recovered UWMM.

#### **1.4.1. Purpose**

The purpose of the Proposed Action is to assess the operation and feasibility of both ROUMRS and EHDS. The Proposed Action will allow the Army to determine if these technologies meet the DoD's requirements for the safe, remote recovery of UWMM and for the destruction of any recovered UWMM in an environmentally benign manner that does not increase the potential explosives safety risks. If successful, ROUMRS and EHDS will provide DoD technologies it needs to address UWMM determined to pose an unacceptable risk to human health or the environment.

Currently, when appropriate and within DoD authority, DoD addresses UWMM that are determined to pose an unacceptable threat to human health and the environment by using explosive ordnance disposal (EOD) or UXO-qualified divers to recover or detonate the UWMM in-place. ROUMRS has the potential to substantially reduce the requirement for divers to both enter the water to address munitions and detonate UWMM in place. In addition, the use of ROUMRS and EHDS would reduce the potential adverse impacts to marine environments by reducing reliance on detonating UWMM in place (ARA, 2010b).

In summary, the Proposed Action will provide DoD a means to establish technologies, based on site-specific conditions, necessary to address UWMM that are determined to pose an unacceptable risk to the public. The Proposed Action will also meet the communities' and state's interest in removing some of the UWMM present at Ordnance Reef (HI-06).

#### **1.4.2. Need**

The techniques and tools currently used to address or recover UWMM are not cost effective and may be inadequate for large quantities of munitions of various types in varying states of deterioration. At deeper depths (beyond 120 feet), current recovery tools are extremely limited. Dive operations using EOD or UXO-qualified personnel are limited in the depths to which divers can work. Such operations, which are very expensive to plan and implement, expose divers and support teams to a variety of potential hazards. These potential hazards and the cost of these operations increase significantly as the water depth increases (ARA, 2010a).



Additionally, the current method for disposal of UWMM is intentional detonation of the UWMM in place using explosive charges. The detonation of explosives at culturally and environmentally sensitive locations is often a controversial issue for state and federal regulators and the public. Although detonation in place, also referred to as blow-in-place (BIP), operations will always be required for munitions for which the risk of movement is unacceptable, the DoD also needs safe and cost effective disposal alternative to support its munitions response operations.

In summary, UWMM, in some circumstances, may pose a potential explosive hazard to human health and the environment, and DoD's ability to address the recovery and disposal of UWMM is currently limited. Therefore, DoD needs to develop UWMM recovery and destruction methods that provide greater efficiency, human and environmental safety and protection.

### **1.5. Regulatory Framework**

In addressing environmental considerations, the DoD is guided by several relevant statutes and Executive Orders (EO) that establish standards and provide guidance on environmental and natural resource management and planning. These statutes and EO include, but are not limited to, the Rivers and Harbors Act (RHA), Coastal Zone Management Act (CZMA), Endangered Species Act (ESA), Fish and Wildlife Coordination Act (FWCA), Magnuson-Stevens Fishery Conservation and Management Act, National Historic Preservation Act (NHPA), Resource Conservation and Recovery Act (RCRA), EO 13089 (Protection of Coral Reefs), EO 12898 (Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations), and EO 13045 (Protection of Children from Environmental Health Risks and Safety Risks). Key provisions of these statutes and EOs are discussed throughout subsequent sections and in detail in Section 5.0 of this EA.

## 2. Description of the Proposed Action and Alternatives

This section describes the alternatives, including the Proposed Action, that were developed to meet the following objectives:

- Perform a demonstration of technologies capable of remotely recovering UWMM and demilitarizing recovered military munitions safely;
- Provide for the safety of personnel supporting the Proposed Action and the public;
- Limit damage to the ocean environment (e.g., coral reefs) during the recovery process;
- and Restore the ocean environment to a more natural state following the project.

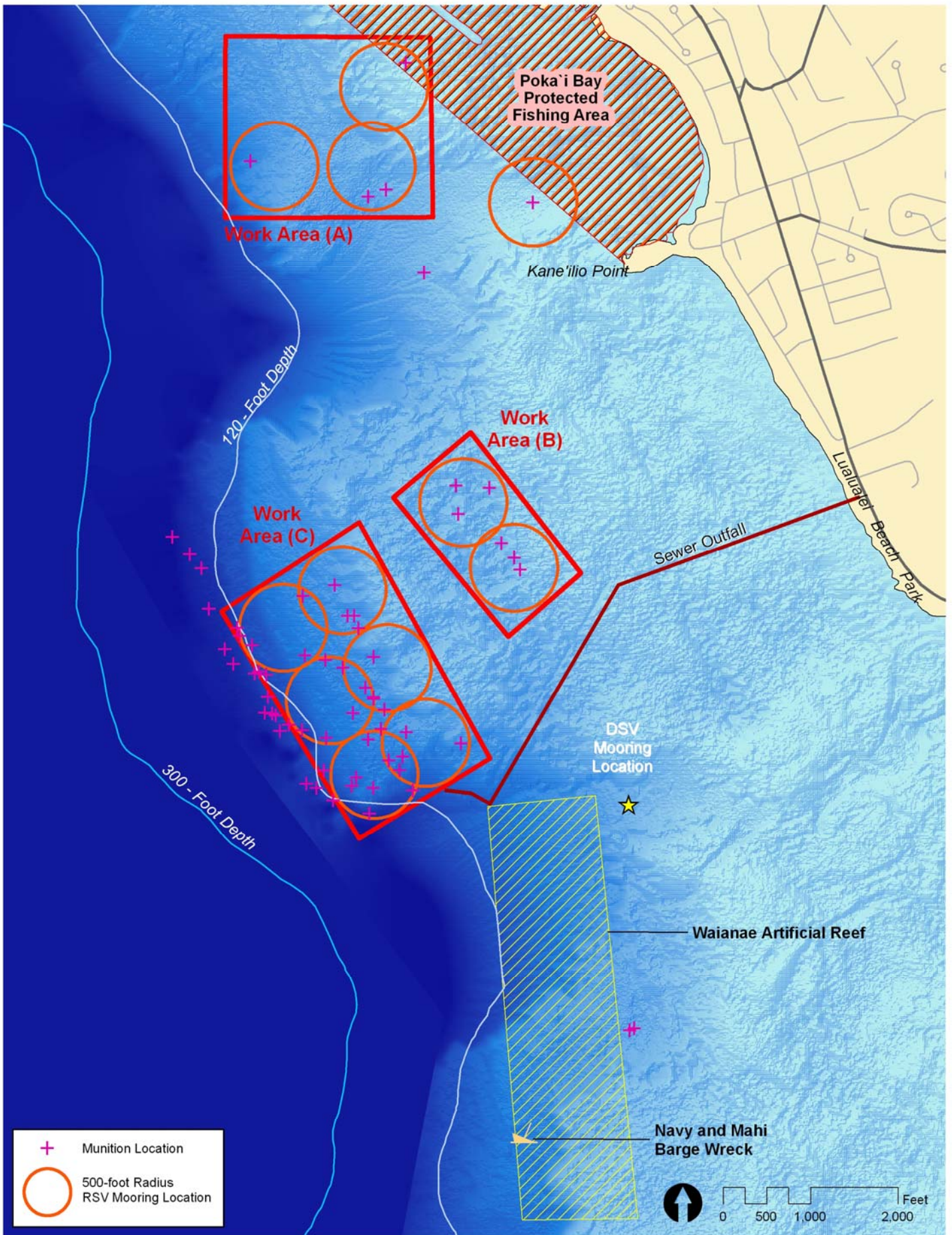
### 2.1. Proposed Action (Preferred Alternative)

The Proposed Action consists of technology assessments that will result in the limited, remote recovery of UWMM using ROUMRS from the ocean floor and the destruction of any recovered military munitions using the EHDS mounted on a barge at the Demonstration Site (Ordnance Reef (HI-06)). The Proposed Action is not an environmental response (removal action), but a limited technology demonstration that will occur over roughly a 21 day period. The Proposed Action is designed to evaluate the recovery of UWMM using the ROUMRS and at-sea destruction of recovered military munitions using EHDS.

All vessels and equipment for the Proposed Action will be operated out of the Waiʻanae Small Boat Harbor (WSBH) with the actual technology demonstration occurring at the Demonstration Site (Ordnance Reef (HI-06)). The Proposed Action, which will involve both underwater and surface operations, will be accomplished in two stages:

- Stage 1 Recovery of UWMM – This stage involves the subsurface collection and transfer of UWMM in depths of approximately 30 to 120 feet using the ROUMRS technology.
- Stage 2 Demilitarization of Recovered Military Munitions – This stage involves surface operations consisting of the recovery of UWMM from ROUMRS and the subsequent destruction of recovered military munitions using EHDS.

Recovery activities are proposed to occur within three Work Areas. These areas have been designated as areas A (approximately 112 acres); B (approximately 53 acres); and C (approximately 128 acres). ROUMRS will deploy its remotely operated vehicle (ROV) from and be tethered to a moored 75-foot ROV Support Vessel (RSV). The RSV will transport the ROV to and from each area. The RSV will also house ROV operators, observers and equipment needed for the operators to monitor the ROV. The ROV will place recovered UWMM in specially designed salvage baskets, and transport the baskets to one of several underwater staging areas until the baskets are transported by the ROV or lift bags to the surface for destruction. Demilitarization and destruction activities will occur on a moored barge designated the Demilitarization Support Vessel (DSV). The Work Areas for the Proposed Action, and the RSV and DSV mooring locations are shown in Figure 3.



**Proposed Work Areas and Mooring Sites**

**FIGURE 3**

### **2.1.1. ROUMRS**

ROUMRS is an innovative use of commercial off-the-shelf technology that employs a ROV and employs techniques adapted from underwater search and recovery efforts. ROUMRS consists of an off-the-shelf ROV that has been retrofitted with manipulator arms, detachable salvage baskets, a hopper, recovery skids, video cameras, LED (light-emitting diode) lights, suction and jetting pumps, filters, sensors, and other appurtenances. System features of the ROUMRS are shown in Figures 4 and 5.

ROUMRS four subsystems are designed to perform specific tasks. ROUMRS four subsystems are:

- Base ROV and Manipulators Subsystem – Consists of the base ROV that includes the frame, flotation, thrusters, onboard hydraulics, vehicle and topside controls, topside power distribution, umbilical, launch, and recovery support equipment. In addition, manipulators used with the ROV include onboard port and starboard manipulators and control valves, and topside controls.
- ROV Sensor Subsystem – Consists of remote sensing equipment including camera systems, SONAR system, sub surface navigation system, and topside data monitoring and recording equipment and software.
- ROV Recovery Subsystem - Consists of the ROV Hopper with integral basket, actuator and control interface, manipulator tooling, and the suction pumps with discharge filter for recovering small particles (greater than 1/8 inch).
- Salvage Basket Subsystem – Consists of the salvage basket frame and the lift and tow rigging. The salvage basket's features include: opening-closing and locking fill doors, ROV lifting features, air lift bag with air bottle inflation, containment of bulk MC and 2,000-pound lifting capacity.

ROUMRS is designed to help identify, manipulate, and collect UWMM of various types from the ocean floor to a maximum depth of 300 feet. During the Proposed Action, ROUMRS will conduct a limited recovery of UWMM from depths between approximately 30 and 120 feet of water. After placing mooring blocks for the RSV, recovery activities will consist of five basic operational steps:

- Spot and set salvage basket on ocean bottom
- Recover and load UWMM into the ROV
- Transfer UWMM from the ROV to a salvage basket
- Stage and prepare the salvage basket for movement to surface
- Transfer (tow) the salvage basket to DSV



**Dimensions:** 90”L x 51”W x 69”H  
**Air Weight:** 3040 LBS  
**Seawater Weight:** +200LBS

**Optics**

- (2) Wide Angle Color-1 fixed , 1 on tilt actuator
- (1) 36X Color Zoom on Pan/Tilt actuator
- (1) Manipulator Color Camera w/ LED light
- (2) Lasers with line beam optics

**Lights**

- (6) 250 VA LED wide flood

**Manipulators**

- Dual 7-function arms, (1) w/ force-feed back

**Hydraulics**

- 15kW HPU with 16 function valve pack

**Vehicle rated for 300m operations**

- Upgradable to 2000m – requires floatation change

**Thrusters**

- (3) vertical 496LB up/down thrust
- (4) horizontal 496 LB fwd/rev/lateral thrust

**Hopper Assembly**

- 200LB lift capacity with a 5.8 FT<sup>3</sup> fill volume

**Suction/jetting pump with Canister Filter**

- 3/16” filter-passes sand/retains propellant grains
- Suction nozzle carried by manipulator
- Canister Filters are jettisoned and later recovered in Salvage Basket

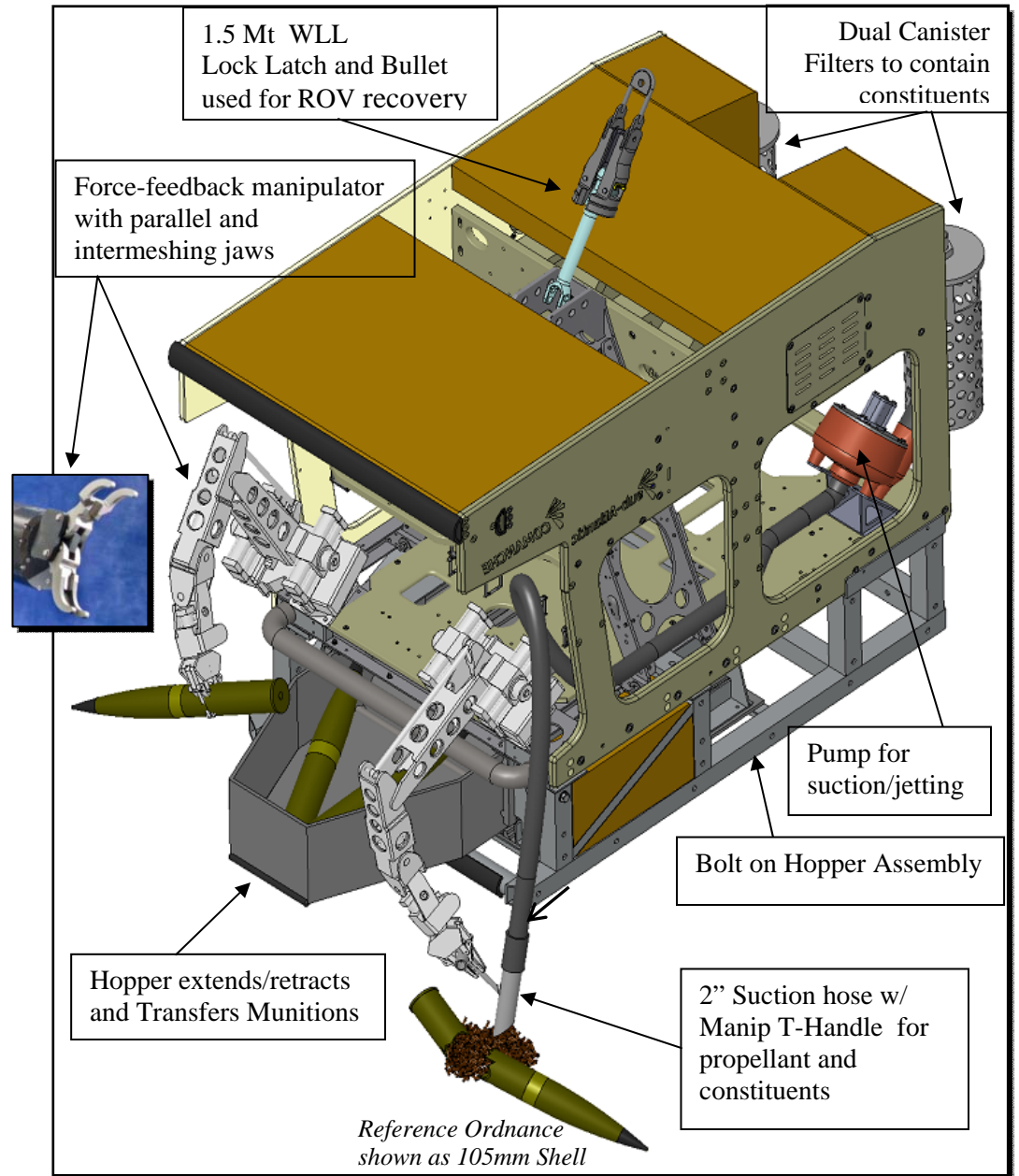
**Onboard Sensors**

- Scanning Sonar, depth, heading, roll/pitch

**Fiber Optic telemetry :** can install wide variety of sensors on spare fibers: (Ethernet, RS232, and RS484 serial data)

**Optional Equipment**

CTD, Current Speed, Explosive Plume Detector, water/sediment core sampling, altimeter, acoustic imaging



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**ROUMRS ROV System Features**

EA for Technology Demonstration: ROUMRS and EHDS at Ordnance Reef (HI-06)

**FIGURE 4**

Wai'anae, O'ahu, Hawai'i

**Overall Dimensions:** 96”L x 60”W x 42”H

**Loaded Capacity:** 2000LB (in air weight)

**Weight in Air (empty):** 500LB (estimated)

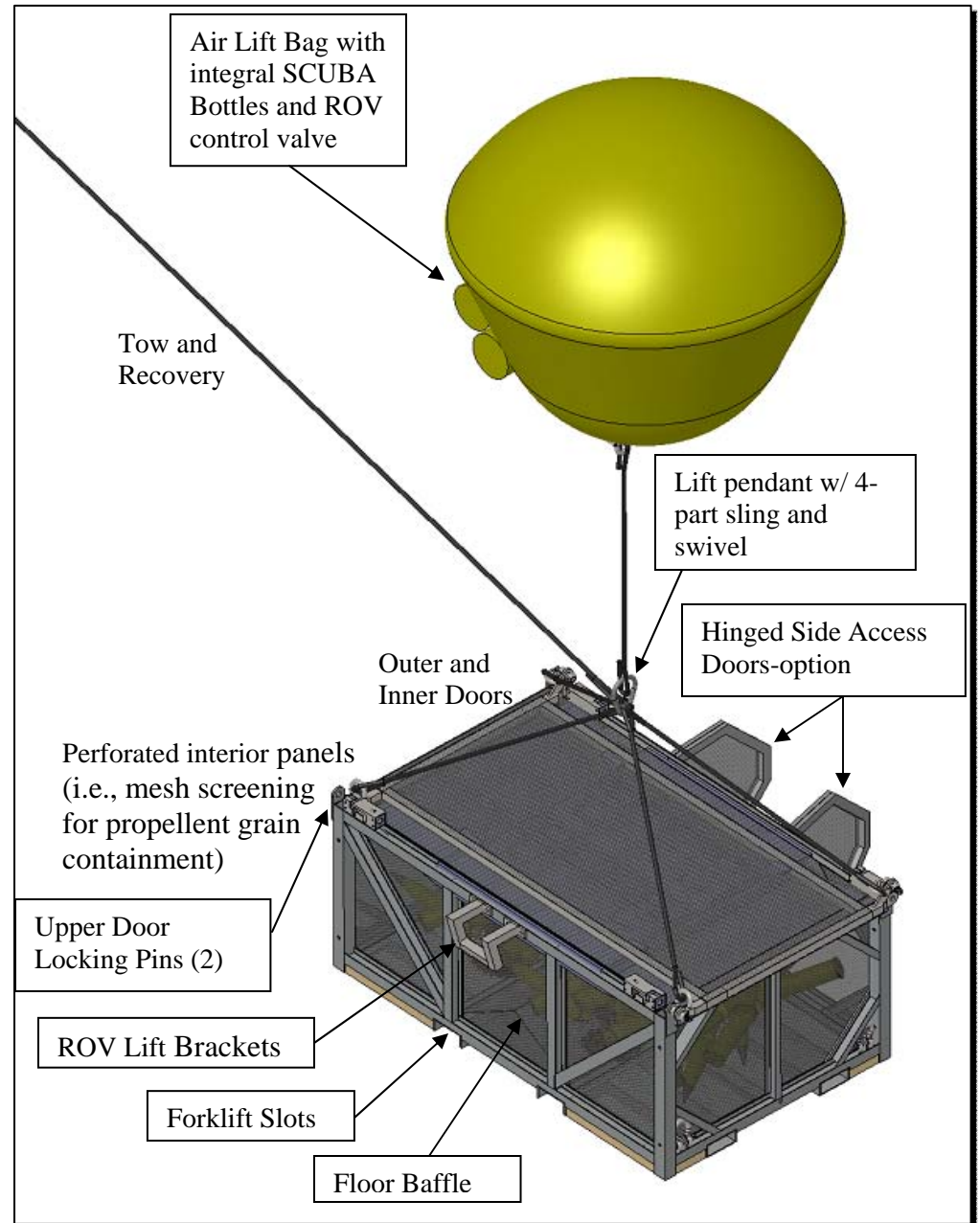
**Weight in Water (empty):** 150 LB (estimated)

**Design Features:**

- Upper Structural Hinged Door
  - ROV locking pins
  - Withstands loading. Supports Inner Door when inverted
- Dual lower Side Door panels: 32”H x 29”W
- Fork lift interfaces on all sides
- Interior lined with 1/8” perforated panels
  - Contains explosive pellets. Drains water/sand
- ROV lift bracket
  - Enables carrying by ROV when empty
- Spring loaded self closing inner door
  - Contains loose pellets
- Interior Floor Baffle
  - Prevents shifting loads
  - Promotes even weight distribution when loading

**Lift Rigging Features**

- Designed to ABS Structural Standards
- 4-part sling with swivel pendant.
- Variable volume 3000LB capacity Air Lift Bag
  - (2) integral SCUBA bottles
  - ROV actuated valve
  - Stowed in compact valise
- Tow line also functions as Recovery Lift Line



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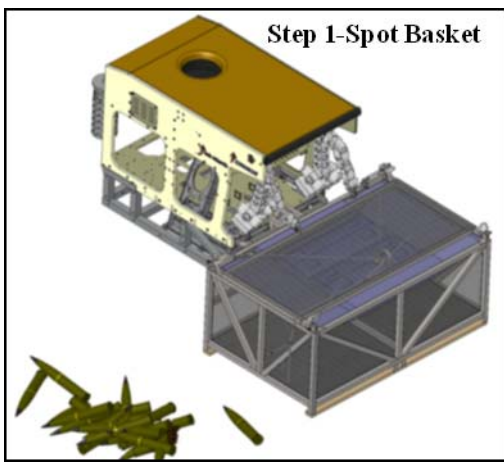
The operational steps are summarized below and illustrated in detail in Figure 6.

- Prior to recovery of UWMM, the ROV performs a reconnaissance of areas adjacent to the UWMM to identify suitable locations for placement of the salvage basket. Sensor equipment used for salvage basket staging area reconnaissance includes: scanning SONAR, wide angle and zooming cameras, pan/tilt camera mounts, underwater lighting, surface and subsurface navigation gear (for path planning and track following), and topside data archiving hardware and software. Once a suitable staging location is identified recovery of UWMM can commence.
- Recovery involves the use of electrically operated manipulators mounted on the ROV. The manipulators, which are capable of precise movements manipulate, grab, and lift UWMM ranging from SAA (i.e., .50 caliber and below) to military munitions up to eight inches in diameter, and bomb shapes that weigh up to 150 pounds. In addition, the manipulators are able to work with equipment to pry concreted UWMM from the ocean's hardbottom or reef.
- ROV manipulators place recovered UWMM into an on-board collection hopper (ROV hopper). When the ROV hopper is full, the ROV transfers the recovered UWMM into specially designed salvage baskets. Recovered UWMM will accumulate in the salvage basket and staged for subsequent movement to the DSV. The ROV manipulators place recovered UWMM that are too large to be placed in the ROV's hopper directly into the salvage basket.
- When the salvage basket has been filled, the ROV closes and locks the salvage basket's door. The salvage basket is brought to the surface using an air-lift bag attached by ROV. The air lift bag is inflated by air bottles that are attached to the salvage basket.

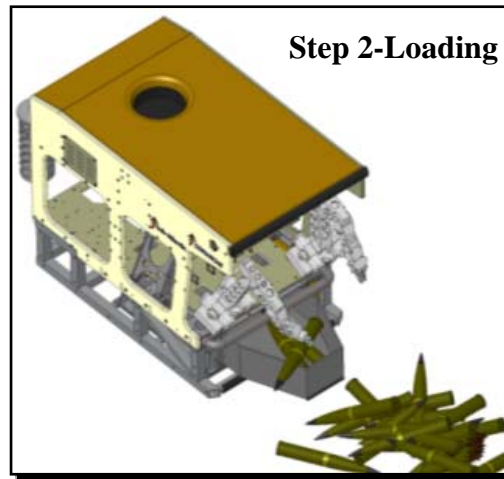
On the water surface a small, manned craft (less than 20 feet in length) operating between the moored DSV and RSV will rig towlines to the salvage basket's tow bridle once the salvage basket is floating approximately 14 feet below the surface. The small craft will tow the salvage basket to the DSV. The crew of the small craft will rig the lift line between the DSV and the salvage basket. The DSV will then lift the salvage basket using an onboard crane onto its deck and place it within a containment berm. The DSV's crew, who are UXO-qualified personnel, will open the salvage basket's upper door and unload the recovered military munitions within the containment berm. The DSV crew then moves the salvage basket to a safe area and prepares it for launch and recovery by the small craft for towing to the RSV. The empty salvage basket will then be lowered for use (ARA, 2010a).

### **2.1.2. EHDS**

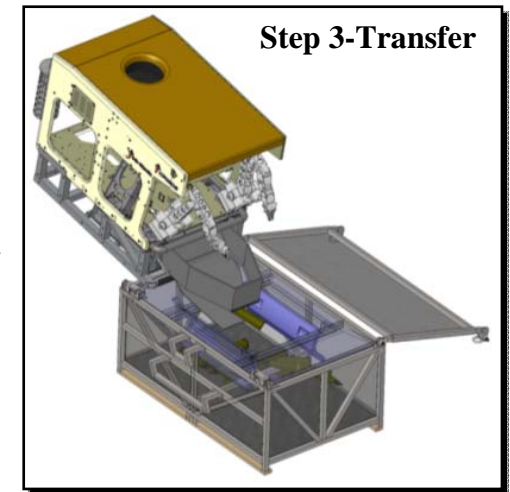
The Army determined that there is no single best technology available to address the variety of military munitions or varying conditions (e.g., corroded, encrusted) that could be used for the disposal of any UWMM recovered during the Proposed Action. In addition, the Army required that the disposal process not increase potential explosive safety risks to workers or the community and required that the destruction process be environmentally benign. As a result,



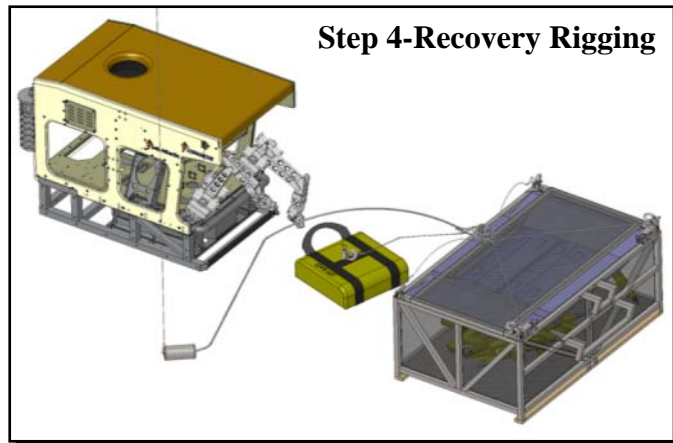
- a. The support vessel transports the ROV to a munitions location and sets anchor
- b. The ROV is deployed
- c. The ROV inspects the bottom for a suitable landing location for the salvage basket
- d. The salvage basket is lowered to the bottom and released
- e. The ROV positions the salvage basket near a concentration of munitions, un-pins and opens an upper door



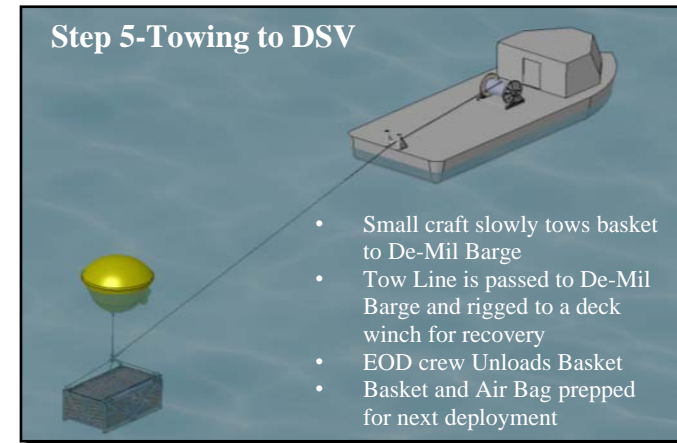
- f. The ROV positions itself near a concentration of munitions
- g. A munition is inspected and documented (video and laser scaling)
- h. A hopper is extended out of the ROV's recovery skid
- i. The ROV's recovers the munitions piece with the manipulator arm and places it in the hopper (smaller debris such as propellants and small arms ammunition are to be captured with a vacuum and placed in a canister filter)
- j. The hopper is retracted, once filled, and the ROV maneuvers to the salvage basket



- k. The ROV lands on the salvage basket, extends it hopper, and transfers its contents (smaller debris captured in the canister filter are also transferred to the salvage basket at this time).
- l. The ROV retracts its hopper and maneuvers to the next recovery location



- m. Once the salvage basket is filled, an air lift valve is lowered from the surface to the ROV
- n. The ROV attaches the air lift device and a tow line to the salvage basket
- o. The ROV activates the air lift bag
- p. The salvage basket ascends to the surface



- q. The tow line is attached to the small craft and the salvage basket is transported to the destruction (demilitarization) barge
- r. The process would be repeated until all the munitions pieces that can be recovered have been recovered or until the end of the test window (three weeks) has been reached

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EHDS, which uses a combination of complimentary, proven, munitions disposal technologies and is capable of being barge mounted, was developed. The EHDS is also suited for use at culturally and/or environmentally sensitive locations.

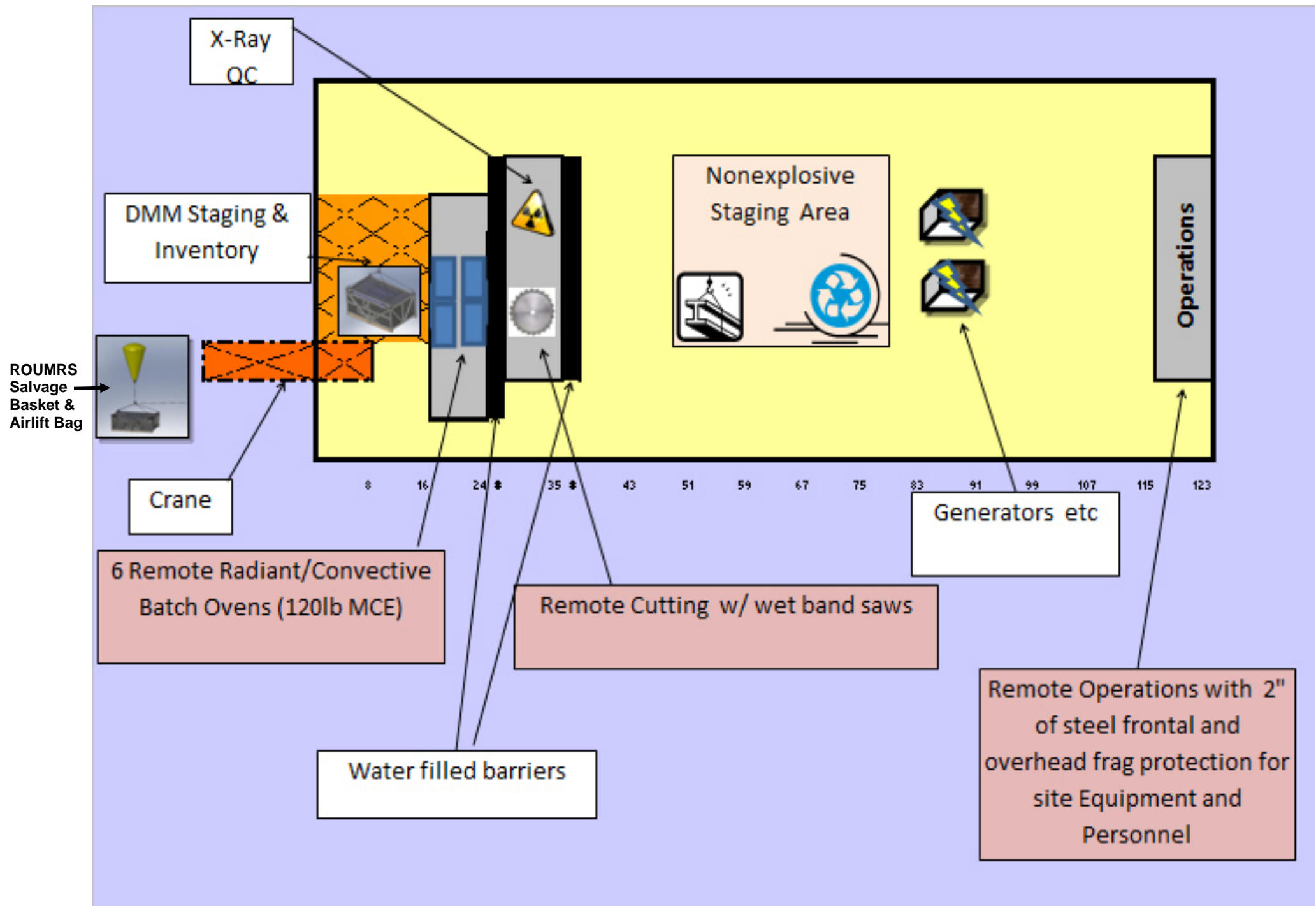
EHDS consists of two complementary technologies: cutting technology (band saw), and Radiant/Convection Batch Ovens (RCBO). EHDS's cutting technology is designed to remotely cut recovered military munitions to expose the explosive MC fill compounds for thermal treatment in the RCBO. The remote cutting of military munitions also constitutes demilitarization. The EHDS's RCBO is designed to thermally treat an explosive MC compound fill until it non-explosively decomposes (i.e., degrades to non-hazardous materials). After thermal treatment, any resulting scrap metal will be inspected and, if appropriate, documented as material documented as safe (MDAS), making it available for recycling.

EHDS's RCBO consists of four ovens housed in a standard 20-foot ISO container, power generators, munitions cutting tool, munitions staging area, crane, and other supporting equipment that is mounted aboard the DSV. The EHDS layout and system features are shown in Figures 7 and 8. The military munitions demilitarization process is described below.

Recovered UWMM are transferred from the ROUMRS salvage baskets onto the DSV. Military munitions, with some exceptions (i.e., SAA, fuzes), that are recovered will be x-rayed to ensure they do not contain a liquid-fill. Should a recovered munition be determined to contain an unknown liquid fill or pose a danger to DSV operations, it will, when possible, be carefully lowered over the side of the DSV and suspended in the water column, with EOD support requested. Prior to being lowered over the DSV's side, munitions with an unknown liquid will be kept wet and wrapped in 6 mil plastic, placed in a sealed propellant can that is placed in a 6 mil plastic bag. Munitions lowered over the side will be suspended off the sea floor, and secured to the barge for safe holding pending completion of all DSV operations. (Depending on the situation, all DSV operations may be halted until EOD dispositions the munition or arrives on site, or the munition may be retained in safe holding until a halt in DSV operations (i.e., at the end of the work day, work week or demonstration) at which time EOD will address any munitions in safe holding.)

With certain exceptions (i.e., SAA, fuzes), the remotely operated cutting tool will open each munition's casing, exposing the explosive MC compound that makes up the fill. Operators will run the cutting and related tools from the remote operations container, which is mounted on the DSV. After cutting, the munition's sections and exposed explosive MC compounds will be placed into open trays for low-temperature thermal treatment in the RCBO.

The RCBO uses low temperature thermal treatment over extended periods of time, safely raising the temperature of the exposed explosive MC compounds in trays until they non-explosively decompose, becoming non-hazardous material. This heating irreversibly breaks down chemical and molecular bonds. A detailed description of the thermal treatment process, including energetic compounds and decomposition products produced can be found in Appendix L (Sections VI and VII).

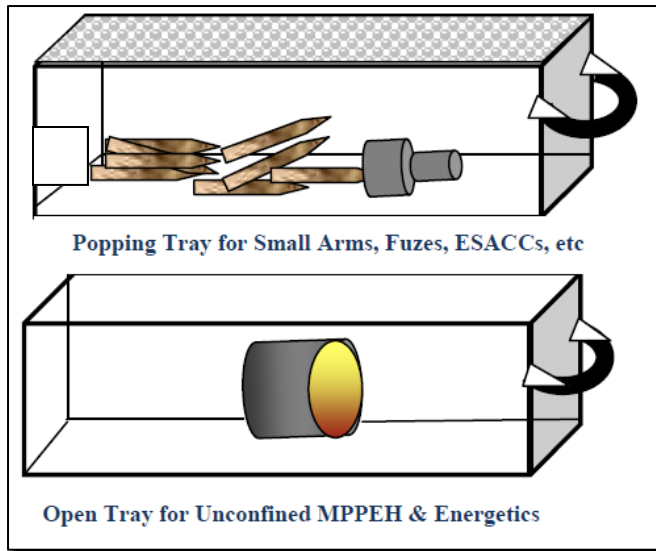


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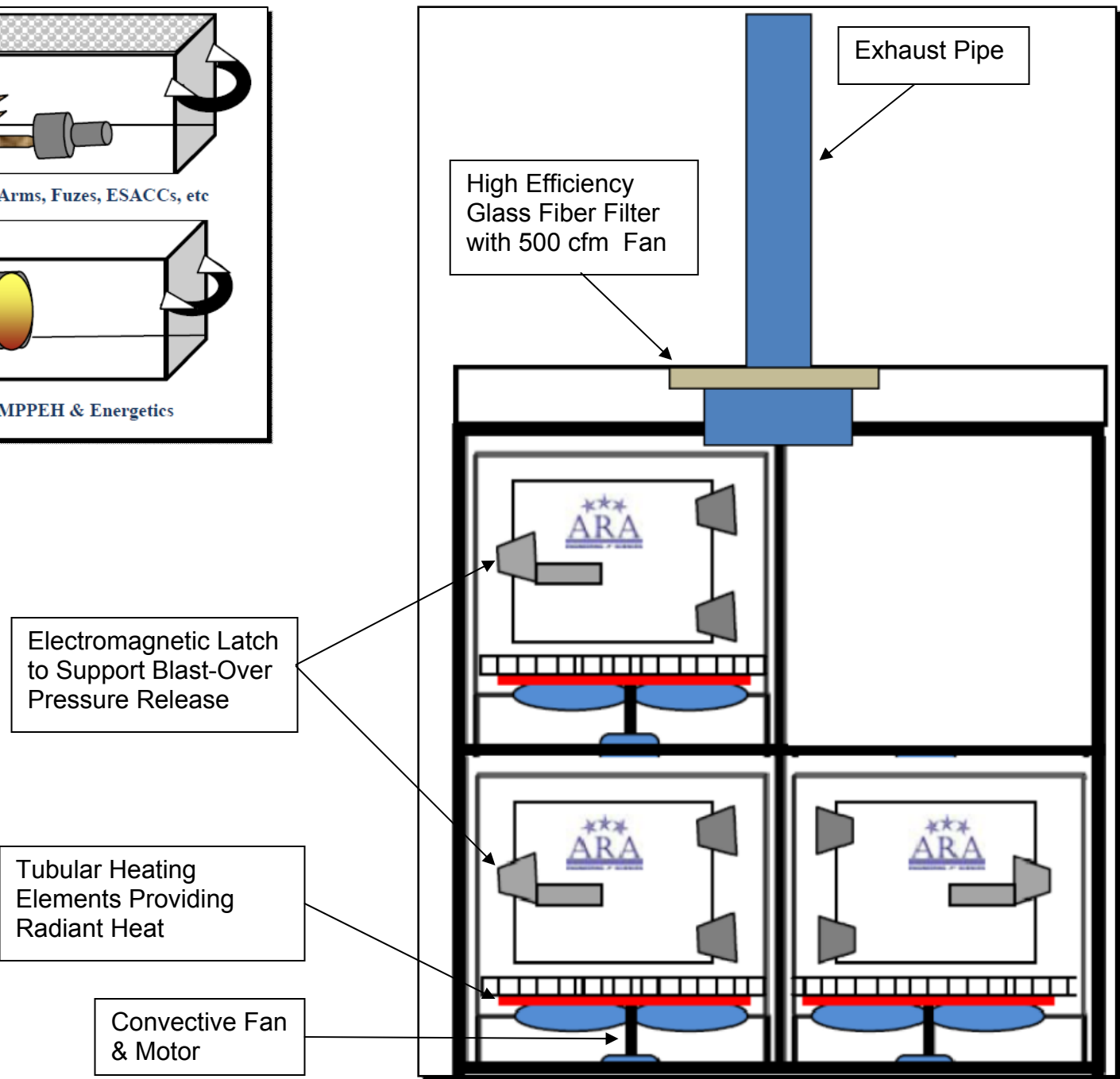
**EHDS System Layout (Aboard DSV)**

**FIGURE 7**

### Munitions Tray



### End View of RCBO in Standard ISO Container



### ***EHDS – Radiant/Convection Batch Oven System***

EA for Technology Demonstration: ROUMRS and EHDS at Ordnance Reef (HI-06)

*Used by permission, ARA, Inc., 2010*

**FIGURE 8**

Wai'anae, O'ahu, Hawaii

It is important to note that the thermal treatment in the RCBO is not incineration. At no time, do flames or the radiant elements of the RCBO contact any of the exposed compounds. Thermal decomposition of the exposed explosive MC is an irreversible reaction that breaks the chemical bonds of the compounds and does not generate explosive gases. The temperatures will be maintained well below the ignition temperature of the exposed explosive MC. Operators within the DSV's remote operations container will perform real-time temperature monitoring to (a) verify that temperatures required for decomposition are reached and maintained; and (b) ensure temperatures that could cause a detonation of the energetic are not reached.

After thermal treatment, the remaining metal scrap will be inspected, and as appropriate in accordance with any requirements of the RCRA permit, documented as MDAS, and recycled, or retained for scientific study. The metal from recovered munitions that has been documented as MDAS may be provided for corrosion studies being conducted by DoD and NOAA.

Until the metals and other residuals have been documented as MDAS, they will be managed as materials potentially presenting an explosive hazard (MPPEH). All residuals and metals not intended for other useful purposes (e.g. further testing) are solid waste and will be managed and disposed in compliance with applicable State law.. The Proposed Action will be in full compliance with RCRA. Applicability of RCRA to the Proposed Action is discussed in further detail in Section 5.10.

It is important to note that the Proposed Action does not involve the intentional detonation of UWMM or of military munitions that have been recovered. EHDS provides an efficient, safe, and environmentally friendly means for the disposal of recovered military munitions. However, in the event a munition is encountered that is determined to pose an explosives or munitions emergency, EOD personnel will be requested to address it as soon as circumstances allow. EOD personnel will address such munitions using approved EOD procedures. These procedures and the circumstances may require detonation in place (underwater) or on the surface at a designated, safe location. Additionally, munitions encountered that contain an unknown liquid fill will be assessed to determine the most likely fill and, depending on the fill, will be destroyed at a designated, safe location using prescribed procedures that may involve use of contained detonation technology or open detonation. To ensure the safety of workers and the public, such munitions will be safely secured in place or at a designated staging area.

The Proposed Action may temporarily interfere with boating, fishing, and other in-water activities during work hours, which will be conducted during daylight hours 7 days a week for roughly 21 days (three weeks). The Proposed Action involves the robotic recovery of UWMM and demilitarization of recovered military munitions on the DSV, which will be positioned near Ordnance Reef (HI-06) approximately one mile off of the Wai'anae Coast. During demilitarization activities, these UWMM are not expected to be an explosive risk. However, during demilitarization activities, a conservative explosive safety quantity distance zone of 537 feet and 3,727 feet will be maintained around the DSV for essential and non-essential personnel, respectively. This safety zone is required by the DoD Ammunition and Explosives Safety Standards in case of an unintentional detonation of military munitions aboard the DSV. RSV and DSV operations may be staggered to enhance the efficiency of the operation. The safety zone will be maintained, when required, by using small craft to keep people and vessels outside

the safety zone - a safe distance from DSV operations. These issues are discussed in further detail in Section 3.2.

The above discussed explosives safety parameters of the Proposed Action, including, but not limited to military munitions treatment, disposal procedures, and the safety zone are addressed in detail in the *Ordnance Reef Technology Demonstration Explosive Safety Site Plan* (ESSP) developed per applicable Army and DoD Ammunition and Explosives Safety Standards (ARA, 2011). The ESSP will be reviewed and approved by the US Army Technical Center for Explosives Safety (USATCES) and separately and independently by the DoD Explosives Safety Board (DDESB) based on the quantity and type of military munitions expected to be recovered. At the time of the writing of this EA, the ESSP is in its draft form. However, the ESSP will be approved and finalized prior to initiation of Demonstration activities.

## **2.2. No Action Alternative**

CEQ regulations require that a No Action Alternative be evaluated. The alternatives for demonstrating developed or innovative technologies are limited. The two alternatives considered are the Proposed Action (the Demonstration) and the No Action Alternative.

Although the Proposed Action could be performed at another location, the Demonstration Site was determined to be the only viable location for these demonstrations because the Army possesses extensive knowledge about the munitions present at the Ordnance Reef (HI-06), including the depth and grid coordinates of individual and clusters of munitions; the site's characteristics (i.e., a close-to-shore, shallow water—less than 120 feet, and a hard bottom surface), which provide conditions ideal for limiting any potential impact to the environment and ensuring safety; and the public's and state's concerns with the presence of UWMM in an area heavily used for recreational and commercial purposes. The Army has no other sites where these conditions exist; therefore, alternative locations were not considered viable. Therefore, only the Proposed Action and the No Action Alternative are analyzed in this EA. Although the No Action Alternative does not satisfy the purpose or meet the Proposed Action's objectives, it has been further analyzed to serve as a baseline from which to compare potential effects of implementing the Proposed Action.

Under the No Action Alternative, the newly developed ROUMRS/EHDS technology would not be demonstrated in the field. The Army would not be able to evaluate the feasibility and effectiveness of these new technologies in the recovery of UWMM and demilitarization of recovered military munitions at sites where UWMM were determined to pose an unacceptable risk to human health or the environment. Consequently, the needs and objectives discussed in Sections 1.4 and 2.0, respectively, would not be met.

## **2.3. Alternatives Considered, But Eliminated from Further Analysis**

During the preliminary evaluation and development stages of the Proposed Action, extensive research was conducted assessing a range of alternative technologies for demonstration. Alternative technologies and locations that were assessed, but eliminated from further consideration are briefly discussed below.

### **2.3.1. Alternative Sites**

Alternative locations where UWMM are known to be present that would allow for the conduct these technology demonstrations are limited. The location chosen for the Proposed Action needs to meet specific criteria. The criteria and requirements used in the selection of Ordnance Reef (HI-06) as the Demonstration Site include:

- Proximity to shore and availability of a port for logistical support
- Weather conditions conducive to operating equipment and without affecting test results (e.g., ocean conditions, temperature)
- Availability of:
  - Local support personnel and vessels
  - Technically qualified personnel to handle and process military munitions
- Shallow depths and bottom features (e.g., hard bottom, limited coral growth, currents) conducive to use of ROT to recover UWMM.
- Extensive knowledge about the site
- Presence of DMM as opposed to UXO
- The presence of both small and large caliber munitions to test the full capabilities of the ROT
- Separation distances that provide for public safety

Based on the above, Ordnance Reef (HI-06) was determined to be the only viable location for these technology demonstrations because the Army possesses extensive knowledge about the munitions present, including the depth and grid coordinates of individual and clusters of munitions; the site's characteristics (i.e., a close to shore, shallow water--less than 120 feet, and a hard bottom surface), which provide conditions ideal for limiting potential adverse impacts to the environment and public safety; and the community's and state's concerns with the presence of UWMM in an area heavily used for recreational and commercial purposes. The Army has no other sites where such conditions exist, therefore, alternative locations were not considered viable.

### **2.3.2. Alternative Technologies**

During the initial stages of the Proposed Action, an extensive review and assessment of existing and innovative recovery and disposal technologies was performed. A large volume of data was collected and reviewed to document the application and performance of different technologies to meet the Army's requirements.

The Army assessed 7 alternative ROT and 14 alternative munitions disposal technologies. Individual technologies and technology combinations were evaluated based on various criteria including, but not limited to:

- Safety and Environmental Features - The ability of the technology to negate potential adverse human health and environmental effects associated with UWMM.
- Operational Capabilities - The capabilities of the technology in relation to operating depth, munitions size, sea states, maintenance requirements, and operating time intervals.
- Equipment Specifications - The identification and description of specific technology equipment components, surface vessels, and support equipment.
- Personnel Requirements - The quantity and training level of personnel required to operate the technology.
- Overall Cost - Technology cost including relocation to site, setup, operation, and maintenance.
- Mobility - The ability of the technology to be moved from site to site.
- Developmental Stage - The current stage of technology development and the time required to provide a system for demonstration.

Based on its assessment, the Army selected the ROUMRS and subsequently selected EHDS—a hybrid of many of the demilitarization technologies the Army reviewed—based on a proposal developed during final selection of technologies for the Proposed Action (NHV, 2009; NDCEE, 2009).

#### **2.4. Proposed Action's Schedule**

The demonstration of ROUMRS and EHDS is planned to be performed over roughly a 21-day period in the summer of 2011. The Proposed Action over this period is scheduled for 12-hours per day, beginning at 0600 and ending at 1800 hours.

### **3. Affected Environment, Environmental Consequences, and Mitigation Measures**

#### **3.1. Natural Environment**

##### ***3.1.1. Water Quality and Sediments***

###### **Significance Criteria**

For the purposes of the EA water quality impacts would be considered significant if a project:

- Violates federal or state water quality standards or objectives;
- Increases contaminant levels in the marine sediments, water column, or biota to levels shown to have potential to harm marine organisms; or
- Changes background levels of chemical and physical constituents or causes elevated turbidity that would produce long-term changes in the receiving environment of the project site, area, or region that would impair the beneficial uses of the receiving water.

###### **Existing Conditions**

Marine waters in Hawai‘i are divided into Class A and Class AA waters. Under Chapter 11-54-03 Hawai‘i Administrative Rules (HAR), the objective of Class AA waters is to preserve them “in their natural pristine state as nearly as possible with an absolute minimum of pollution or alteration of water quality of any human-caused source or actions.” The objective of Class A waters is to ensure that their use for recreational and aesthetic enjoyment is protected. The Wai‘anae coast is designated Class A waters from the southern end of Barbers Point to the northern end of Mākua Beach.

Water quality studies along the Wai‘anae coast describe a "pristine, unperturbed coastal region." Temperature and salinity values indicate that the region is well flushed and minimally affected by surface runoff of terrestrial sediments (Bienfang and Brock 1980; NRDC 2004).

Land-based sources of nutrients from streams and surface water runoff cause localized increases in nutrient concentrations in coastal waters. The uptake of nutrients by marine plants and decomposition of marine life in the sea also contribute to variation in nutrient concentrations found in the water column.

In general, open ocean surface waters near the Hawaiian Islands are oligotrophic (nutrient poor); this is particularly true of waters off dry leeward sides of the islands such as Wai‘anae, where nutrient concentrations are extremely low. Nutrient concentrations in seawater off the Wai‘anae coast are likely to vary with the time of year and location, as observed in other coastal waters of Hawai‘i (De Carlo et al., 2004).



## **Potential Impacts**

### ***Proposed Action***

Potential adverse impacts to water quality and sediment as a result of the Proposed Action are unlikely. Although the Proposed Action includes procedures to limit release of MC, including propellants, it is possible that adverse impacts to water quality and sediments could occur as a result of an unexpected release of MC or an accidental fluid (e.g., oil) spill from equipment used to support the Proposed Action.

Potential impacts resulting from the Proposed Action do not meet the significance criteria, and would not result in significant adverse impacts to water quality or sediments.

### ***No Action Alternative***

Under the No Action Alternative, the UWMM present at the Ordnance Reef (HI-06) at depths between approximately 30 and 120 feet would not be recovered from the marine environment. Conditions would remain unchanged and there would be no impact to water and sediment quality.

### ***Mitigation Measures***

MC-related contamination to the water column and bottom sediments is not anticipated from activities related to the Proposed Action. However, a full set of operational precautionary measures have been developed for the Proposed Action. These precautionary measures are contained and defined in the Best Management Practices (BMP) Plan (BMPP) (see Appendix B). Under the BMPP, the Army and its contractors will strictly adhere to applicable BMPs throughout the Proposed Action to help to prevent any adverse impact to water quality or sediments throughout these technology demonstrations. BMPs that will be implemented to minimize any potential adverse impact to water quality and sediments include, but are not limited to:

- Prior to use, inspect Demonstration-related materials and equipment to be placed in the water to ensure it is free of visible pollutants. The ROV, and any mechanized equipment and other materials will be clean and free of obvious contamination and deleterious substances that may include toxic chemicals and/or clay-coated material.
- Daily pre-work equipment inspections will be conducted to ensure cleanliness and the absence of leaks. All heavy equipment operations will be postponed or halted should a leak be detected, and will not proceed until the leak is repaired and equipment cleaned.
- Fueling of vehicles and equipment related to the Proposed Action will take place at least 50 feet away from the water. Additionally, a spill contingency plan will be in place on landside platforms and all support vessels associated with the Proposed Action. Spill-response equipment such as absorbent pads and containment booms will also be stored and readily available on-site, to facilitate the clean-up of accidental petroleum releases.

- Turbidity and siltation from work related to the Proposed Action is not anticipated as a result of ROUMRS or EHDS operations. Turbidity and siltation from ROUMRS related work is expected to be temporary and localized at each pick-up location. Disturbance of bottom sediment will be minimized through careful movement of the ROV. Turbidity and siltation from EHDS operations is not anticipated.
- Turbidity and siltation from landward work associated with the Proposed Action will be minimized and contained, to the extent possible, within the vicinity of the landward work area through the appropriate use of effective site containment devices and the curtailment of work during adverse tidal and weather conditions.
- Although no construction debris will be generated during the Proposed Action, all waste, debris, and litter on the vessels associated with it will be controlled and not allowed to enter or remain in the marine environment during the Demonstration.
- No materials related to the Proposed Action should be stockpiled in water (intertidal zones, reef flats, stream channels, sea grass beds, etc.).
- Dispose of all Demonstration-related waste that is not recyclable at an approved, properly permitted facility.

Additionally, the ROV is equipped with a vacuum system designed to collect and filter any loose debris including accidental release of MC. The salvage basket has been designed to reduce the potential for an accidental release of MC, including propellant grains. (The salvage basket's siding is constructed of a fine-perforated aluminum sheet, specifically designed to contain any accidental propellant releases from munitions during recovery activities.)

### **3.1.2. Marine Biological Resources**

Due to the nature and location of the Proposed Action, terrestrial biological resources would not be affected. Therefore, for the purposes of this EA assessment of potential impacts to biological resources has been limited to the marine environment.

#### **Significance Criteria**

Impacts to marine biological resources (including corals) would be considered significant if the Proposed Action:

- Causes the “take” of a highly sensitive resource, such as a threatened and endangered or special status species;
- Results in a jeopardy biological opinion by the US Fish and Wildlife Service (USFWS) and/or National Marine Fisheries Service (NMFS);
- Degrades the quality of the environment, substantially reduces the habitat of marine biota species, causes marine biota species to drop below self-sustaining levels, threatens to eliminate an animal community, or reduces the range of a rare or endangered species;
- Alters or destroys habitat that prevents re-establishment of marine biological communities that inhabited the area prior to project activities;

- Exposes marine life to contaminants that could cause acute toxicity or bioaccumulation;
- Causes long-term loss or impairment of a substantial portion of local habitat (species-dependent).
- Adversely affects a population of a threatened, endangered, regulated, or other sensitive species by reducing its numbers; altering behavior, reproduction, or survival; or causing loss or disturbance of habitat.
- Would have a substantial adverse effect, either directly or indirectly, on any listed, proposed, or candidate endangered or threatened species listed under federal ESA. Effects could include reducing the number or restricting the range of a threatened or endangered species.
- Causes injury or mortality or results in an action that could be considered a “take” under section 9 of the ESA; or
- Causes a “Level A or B take” of species protected under the Marine Mammal Protection Act (MMPA).

### **3.1.2.1. Benthic Habitat and Coral Reefs**

#### **Existing Conditions**

The coastal waters off the Wai‘anae coast are characterized by rocky intertidal zones, coral reefs, and offshore pelagic and deep-sea marine environments. Intertidal zones provide rocky habitat to marine invertebrates and plants that are specifically adapted to constantly changing levels of exposure to waves and seawater. Pelagic and deep-sea ecosystems off the Wai‘anae coast are vast and support large marine animals like dolphins, whales, sea turtles, and the occasional endangered Hawaiian monk seal (NOAA, 2007).

The marine environment within Ordnance Reef (HI-06) can be categorized into four major benthic habitat types: (a) Sand, (b) Macroalgae, (c) Uncolonized Hardbottom, and (d) Unknown (NOAA, 2007). The benthic habitat types underlying Ordnance Reef (HI-06) are described below and are shown in Figure 9.

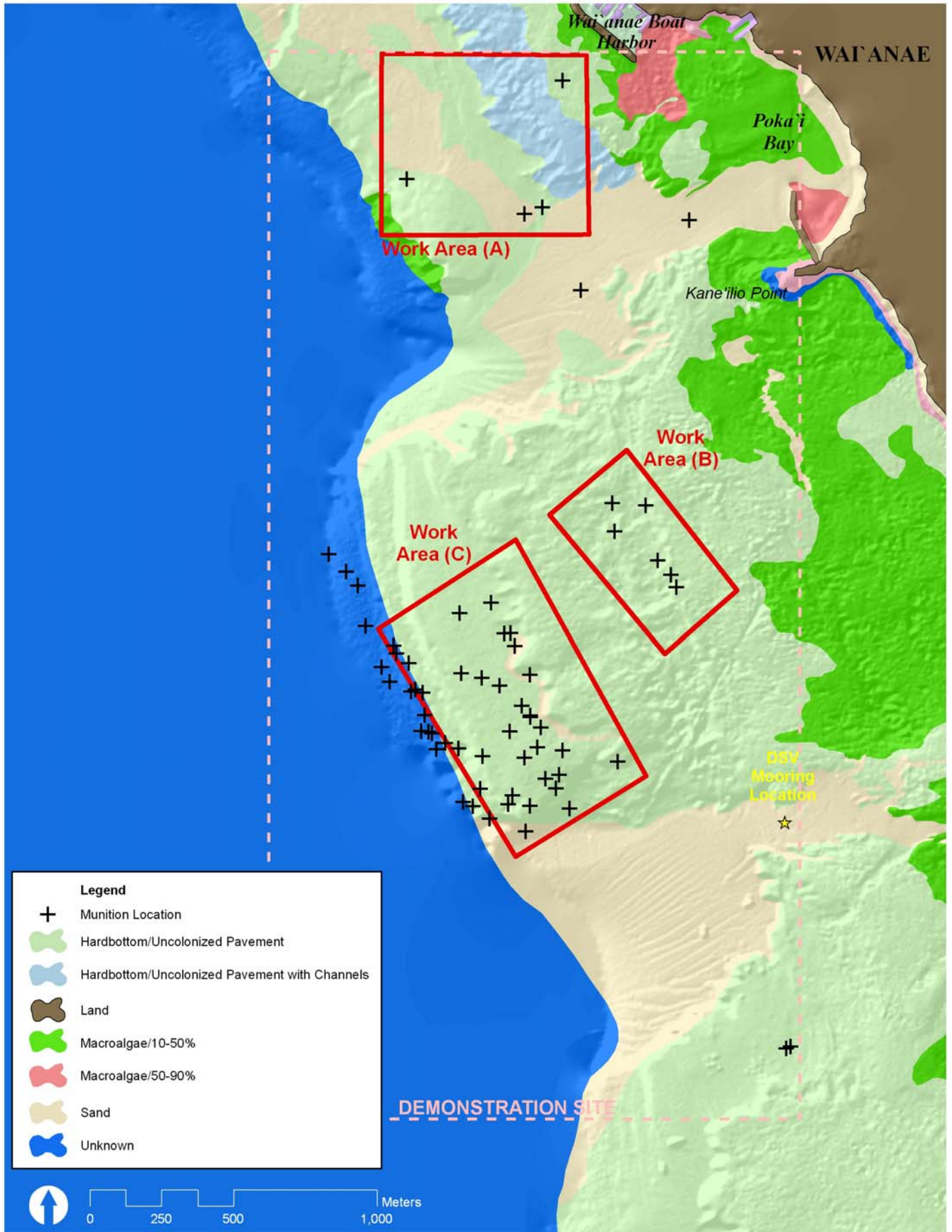
- Sand Habitat – Consists of coarse granular sediment typically found in areas exposed to currents or wave energy. Sand habitat comprises approximately 17.4 percent of the overall Demonstration Site, and 29.5 percent, 0 percent, and 6.5 percent of Work Areas A, B, and C, respectively.
- Macroalgae – Consists of areas with 10 percent or greater coverage of any combination of numerous species of red, green, or brown macroalgae. Usually occurs in shallow back reef and deeper waters on the bank/shelf zone. This habitat type can be further categorized based on the continuity of algal coverage. Of the four habitat types the macroalgae habitat contains the majority of marine life. However, it is the least common of the four habitat types comprising approximately 7.4 percent of the overall Demonstration Site, and 1.5 percent, 0 percent, and 0 percent of Work Areas A, B, and C, respectively.

- Continuous Macroalgae – In these areas, macroalgae covers 90 percent or greater of the substrate. May include blowouts of less than 10 percent of the total area that are too small to be mapped independently. This includes continuous beds of any density (may be a continuous, sparse or dense bed).
- Patchy Macroalgae – These areas contain discontinuous macroalgae with breaks in coverage that are too diffuse or irregular, or result in isolated patches of macroalgae that are too small to be mapped as continuous macroalgae.
- Uncolonized Hardbottom - This habitat is characterized by a hard substrate composed of relict deposits of calcium carbonate or exposed volcanic rock. Uncolonized hardbottom habitat is by far the most prevalent habitat type comprising 43 percent of the overall Demonstration Site, and 69 percent, 100 percent, and 92 percent of Work Areas A, B, and C, respectively.
- Unknown - Comprises the deeper areas, in the western portion of Ordnance Reef (HI-06), outside of the 20-fathom (120 foot) line, that have not been identified. Unknown areas comprise approximately 32 percent of the overall area, and 0 percent, 0 percent, and 1.7 percent of Work Areas A, B, and C, respectively.

Coral reefs in Hawaiian waters provide shoreline protection from waves and storm surge. They have provided a continuous supply of fresh fish and other basic food for the people of Hawaiʻi for the past thousand years. They are the source of the sand for Hawaii’s beaches. They are an integral aspect of Hawaii’s multi-billion dollar tourist industry, providing countless snorkeling, diving, surfing, and fishing opportunities. Coral reefs and hard bottom habitats are found along the length of the Waiʻanae coast and provide food and shelter for reef fish and invertebrates (DBEDT, 2004).

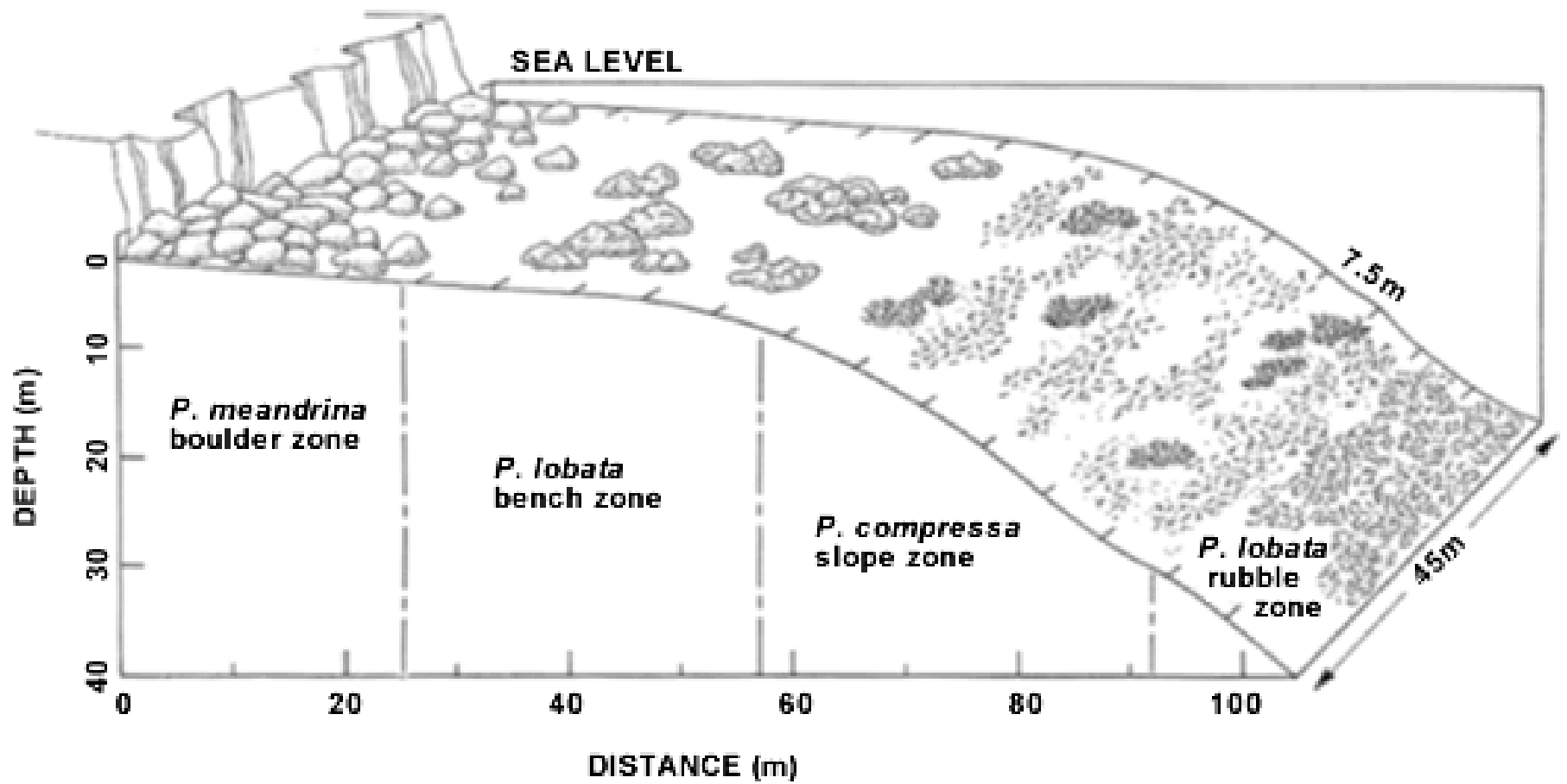
Most coral reefs in the waters around the inhabited islands of Hawaiʻi are known as fringing reefs, growing near the shoreline. Fringing reefs are the first type of reef to form around young volcanic islands, such as Hawaiʻi, Maui, Oʻahu, and Kauaʻi. These reefs form in areas of low rainfall runoff, primarily along the leeward shores, such as the Waiʻanae coast of Oʻahu.

Generally, coral reef structure can be divided into four different zones. Typical reef zonation consists of the following: (a) reef flat zone (0 to 6.5 feet or 0 to 2 meters), (b) reef bench zone, (6.5 to 32.8 feet or 2 to 10 meters), (c) reef slope zone (32.8 to 98.4 feet or 10 to 30 meters), and (4) rubble zone (98.4 to 131.0 feet or 30 to 40 meters) (AECOS, Inc., 2002). A schematic diagram illustrating the reef depth profile and approximate zone boundaries is shown in Figure 10. Descriptions of the four reef zones are provided below.



**Benthic Habitat**

**FIGURE 9**



**Coral Reef Zones**

**FIGURE 10**

- Reef Flat Zone – On the Wai'anae coast, sand occurs along the shore and is affected by substantial wave energy, especially through the winter due to the wrap-around effect from North Pacific storms. Below the waterline, sand is replaced by a limestone platform, or reef flat, that extends several feet offshore. This platform is virtually barren of macro invertebrates and macroalgae, although covered with short turf algae. Corals, represented by the compact and sturdy cauliflower coral (*P. meandrina*), are distributed in patches on the reef flat. Animals living in this zone must contend with strong surge and crashing waves by either boring into the rock (urchins), or by darting out between waves from a protective hole to feed on turf algae (AECOS, Inc., 2002).
- Reef Bench Zone – The limestone platform drops off vertically within 30 to 65 feet (10 to 20 meters) from shore, and the deeper vertical portions, known as the reef bench, contain the corals *P. meandrina*, *Porites lobata*, and *Lepastrea purpurea*. In areas of boulders, the common brown algae (*Padina* spp.) and red algae (*Liagora* spp.) are present. Unattached benthic invertebrates, such as sea urchins, are rare. Reef fish are moderately abundant around the boulders, and in the deeper areas of the shoreline bench (AECOS, Inc., 2002).
- Reef Slope Zone – Wave energy subsides at the depth of the reef slope zone, and the more delicate finger coral becomes common. The greatest concentration of living organisms is here, at the reef's seaward edge, where plankton and clear water of normal salinity are dependably available. The characteristics of the seafloor are of great importance in structuring fish communities and in determining the number of fishes living in the area. In areas of high relief, where fish can seek refuge, a high abundance and diversity of fishes are present. Large schools of ta'ape (bluelined snapper; *Lutjanus kasmira*), kole (goldring surgeonfish; *Ctenochaetus strigosus*), aloiloi (black damselfish; *Dascyllus albisella*), and other common fish species are present swimming over these rocks (Russo, 1997).
- Rubble Zone – Coral cover diminishes in the rubble zone, and coral rubble and sand dominate the seascape. Sandy bottoms or pavement rock generally attract very few fish, and fish concentrations drop off considerably, as the habitat provides little refuge in this zone (AECOS, Inc., 2002).

Off the Wai'anae coast, the seafloor beyond the reef begins at approximately 328 feet (100 meters) depth, and continues to a depth of 16,400 feet (5,000 meters). Sand and sediment cover limestone and volcanic rock where currents do not scrub the seafloor bare. A massive and ancient landslide of the Wai'anae mountain range exists 100 miles offshore (approximately 160 kilometers from the coast) in waters approximately 2.5 miles deep (4,000 meters) (NOAA, 2007).

Areas along the Waianae coast are fairly heterogeneous with sections of uncolonized hard bottom and sand as well as sections of low to high coral cover. Most of the seafloor is uncolonized pavement—a flat hardbottom of volcanic or limestone rock, interspersed with sand channels. However, corals thrive on the artificial reefs and on the armor rock at the inshore WWTP outfall pipeline, probably because of artificial topographical relief (Harrison, 1987; Russo, 1997).

The Wai‘anae coastal waters are dominated by two common coral species, *Pocillopora meandrina* and *Porites lobata*.

- *P. meandrina* (a.k.a. the cauliflower coral) is one of the four most abundant species of Hawaiian reef-building corals. It is a surge-tolerant species that inhabits exposed shorelines and the surge zone of reef slopes. Its dense skeleton, sturdy branches and symmetrical head formation are well suited to the moderate wave action encountered close to the surface. It is the dominant coral species on reef slopes at depths of less than 10 feet, but can also be found to greater than 85 feet or more in depth (Russo, 1997).
- *P. lobata*, a massive and encrusting species, is the most common coral in the main Hawaiian Islands. It is surge-tolerant and can be found in a variety of habitats, from tide pools to depths of approximately 145 feet. It is most common on wave-exposed reef slopes between three and approximately 10 to 45 feet, in a zone below the cauliflower coral. The thin encrusting species *Lepastrea purpurea* is also found in Wai‘anae coastal waters (Russo, 1997).

Overall, the habitats and topographical features encountered within the three Work Areas (A, B, and C) are fairly typical of O‘ahu consisting of a shallow reef flat and a deeper reef bench sloping down to a deeper plateau. The work areas are qualitatively different in their relative coral abundances, benthic habitat distributions, and three dimensional complexities. Common coral species encountered in the three Work Areas include: *Pocillopora meandrina*, *P. eydouxi*, *Porites lobata*, *P. evermanni*, *P. duerdeni*, *Leptastrea sp.*, and *Montiporas* (NOAA, 2011).

More detailed descriptions of the benthic habitat, relative coral coverage, and UWMM present in each of the proposed Work Areas is provided below (NOAA, 2011):

- Work Area A: Contains the highest level of coral abundance, coral density, and three dimensional coral habitat complexity of the three Work Areas. Work Area A is the only area found to contain large old *Porites sp.* colonies. Shoreward areas are composed of hard bottom reef flat with intermittent spur and groove formations as well as large depressions in about 30 to 40 feet of depth. Moving seaward, the intermittent spur and groove formations lead to deeper sand flats in 50 to 60 feet of water, gradually extending deeper to 70 to 80 feet.

This area contains the least amount of munitions of the three Work Areas (Table 1-1). The only munitions found in this area are individual SAA, comprising approximately 0.1 percent of the total number of SAA found among all three Work Areas.

- Work Area B: Ranges in depth from approximately 30 to 50 feet running inshore to offshore. The area is relatively heterogeneous in terms of flat, hard bottom substrate with intermittent high points supporting greater coral abundances and densities, as well as some patches of sand habitat.



SAA, small to medium, and large caliber military munitions are present in Work Area B. Approximately 2 percent of the total number of SAA surveyed are found in the northern part of the Work Area and are mostly found individually or in small piles. Approximately 20 percent of the total number of documented small to medium caliber military munitions are found in the northwest section of the area and are found consolidated in blocks of multiple munitions. A small number of individual large caliber munitions are spread across the center of the Work Area.

- Work Area C: Overall, the area is characterized by a flat, hard bottom shelf inshore at roughly 50 to 60 feet of depth. This shelf gives way, moving seaward, to a steep slope down to a deeper plateau at approximately 70 feet depth. This plateau gradually slopes seaward to depths of approximately 130 feet. Work Area C has the lowest coral abundances, densities, and complexity, of the three Work Areas. However, it still contains substantial habitat heterogeneity and discrete areas with relatively high amounts of corals. The highest coral presence is located on the shallow shelf (50 to 60ft depth) found on the shoreward side of the Work Area. The deeper shelf (70 feet and greater) is characterized by substantial habitat heterogeneity, with habitats ranging from relatively high coral abundance, to hard bottom with lower coral abundance, and areas of sand and rubble.

Work Area C contains approximately 92 percent of all UWMM found within the three Work Areas (Table 1-1). The area contains 98 percent, 80 percent, and 100 percent of all SAA, small to medium caliber munitions, and large caliber munitions, respectively. SAA are present as individuals to small areas with a 1,000 or more; small to medium caliber munitions are present in consolidated groups, and large caliber munitions are spread throughout the area both individually and in small groups. All of the larger munitions such as the small and large categories of projectiles are found in Work Area C. Small projectiles are present individually and in small clusters, while the large projectiles are found individually.

## **Potential Impacts**

### ***Proposed Action***

Adverse impacts to corals could potentially occur if they are accidentally damaged or destroyed during activities related to the Proposed Action; particularly the recovery of UWMM, as a result of moorings and anchorages; the ROV tether line; mechanical damage from the ROV manipulators; release of MC from damaged munitions; or the accidental detonation of UWMM. In addition, UWMM, which have provided a suitable substrate and relief from the ocean bottom, are conducive to coral growth. Some munitions are heavily fouled with algae and benthic organisms. In some cases, munitions were observed with substantial coral growth. Removal of munitions that have coral growth could result in damage to corals.

A summary of potential adverse impacts to corals as a result of the recovery of UWMM by the ROV and RSV, and DSV mooring activities is presented below. More detailed discussion regarding potential injury risk to corals is presented in Appendix C.

### ROV Recovery Operations

In Work Area A, the risks of coral injury are mostly moderate to high, particularly in the northeast portion of the Work Area where the large *Porites sp.* colonies are present (See Appendix C, Figure 19).

In Work Area B, the risks of coral injury are mostly low. However, due to the spatial heterogeneity of habitats in the area there are moderate risk sites in close proximity to flat uncolonized hard bottom and sand (See Appendix C, Figures 21 and 23).

In Work Area C, the risks of coral injury among SAA and small to medium caliber munitions sites range from low (where munitions are found on sand or uncolonized hardbottom) to high (where munitions are located in areas of high coral abundances and *P. eydouxi* colonies are present). Risks of coral injury are also variable among large caliber munitions (See Appendix C, Figures 21, 23, and 28). There is an area in the southwestern section of Work Area C that has moderate risks and one large caliber munition located in a moderate to high risk area. However, most of the large caliber munitions are present in relatively low risk areas.

There is an area in the southwestern portion of Work Area C that has higher risks in general than most other areas. There are also several moderate to high level risk sites in the central northern portion of the Work Area. Most of the large caliber munitions were found in sites that present relatively low risk of coral injury, although a few were found in low to moderate risk areas (See Appendix C, Figure 28).

### Mooring Activities

The level of coral abundance, densities, and habitat heterogeneity in waters shallower than 60 feet in depth in all Work Areas present a substantial risk of coral injury from mooring activities. The deeper plateau starting at the 70-foot depth in Work Area C also contains areas of relatively high coral abundances and densities. However, these areas are fewer and farther apart than similar areas found in shallower depths. Therefore, the deeper plateaus represent a moderate risk of coral injury from RSV mooring activities.

The area to the south of the Work Areas designated as the Waianae Artificial Reef (a.k.a. Fish Haven) contains a large section of flat sand habitat which presents a low risk area to conduct mooring activities. South of the low risk area, but still within the Waianae Artificial Reef site, is an area similar to the 60-foot depth shelf in Work Areas A and C where coral is present and abundant. This area represents another high risk area for mooring activities. Areas of potential coral injury risk associated with mooring activities are shown in Figure 11.

It should be noted that the DSV mooring site was originally proposed to be located within the surveyed, relative low risk, area of the Waianae Artificial Reef. However, the DSV mooring site was relocated outside, and to the east of, the surveyed area due to its proximity to the Navy and Mahi Barge recreational dive sites located to the south (see Figure 11). It is highly probable that the benthic habitat in the immediate adjacent area (including the DSV mooring site) is similar in nature to the low risk areas identified within the Waianae Artificial Reef (i.e.,

Predominantly sand or uncolonized hardbottom with little or no vertical relief and low coral cover). However, prior to conducting mooring activities, NOAA will survey and confirm that the proposed DSV mooring location is within a relative low risk impact area or will identify an alternate low risk location.

In summary, the Proposed Action will result in unavoidable adverse impacts to corals. However, these impacts do not meet the significance criteria, as they can be effectively mitigated to less than significant impacts.

An indirect beneficial impact resulting from the Proposed Action would be the limited recovery of UWMM between approximately 30 and 120 feet of depth, and the return of the marine environment within the Demonstration Site to a more natural state. In addition, UWMM are often encountered and investigated by recreational divers. The limited recovery of UWMM from depths of between approximately 30 and 120 feet would reduce the potential human health and safety risks associated with divers moving, disturbing, or attempting to recover UWMM as souvenirs, for scrap value, or for other purposes. Indirect beneficial impacts would also occur as a result of the Proposed Action as future risk of damage and/or destruction of corals in the event of an accidental detonation would also be reduced.

### ***No Action Alternative***

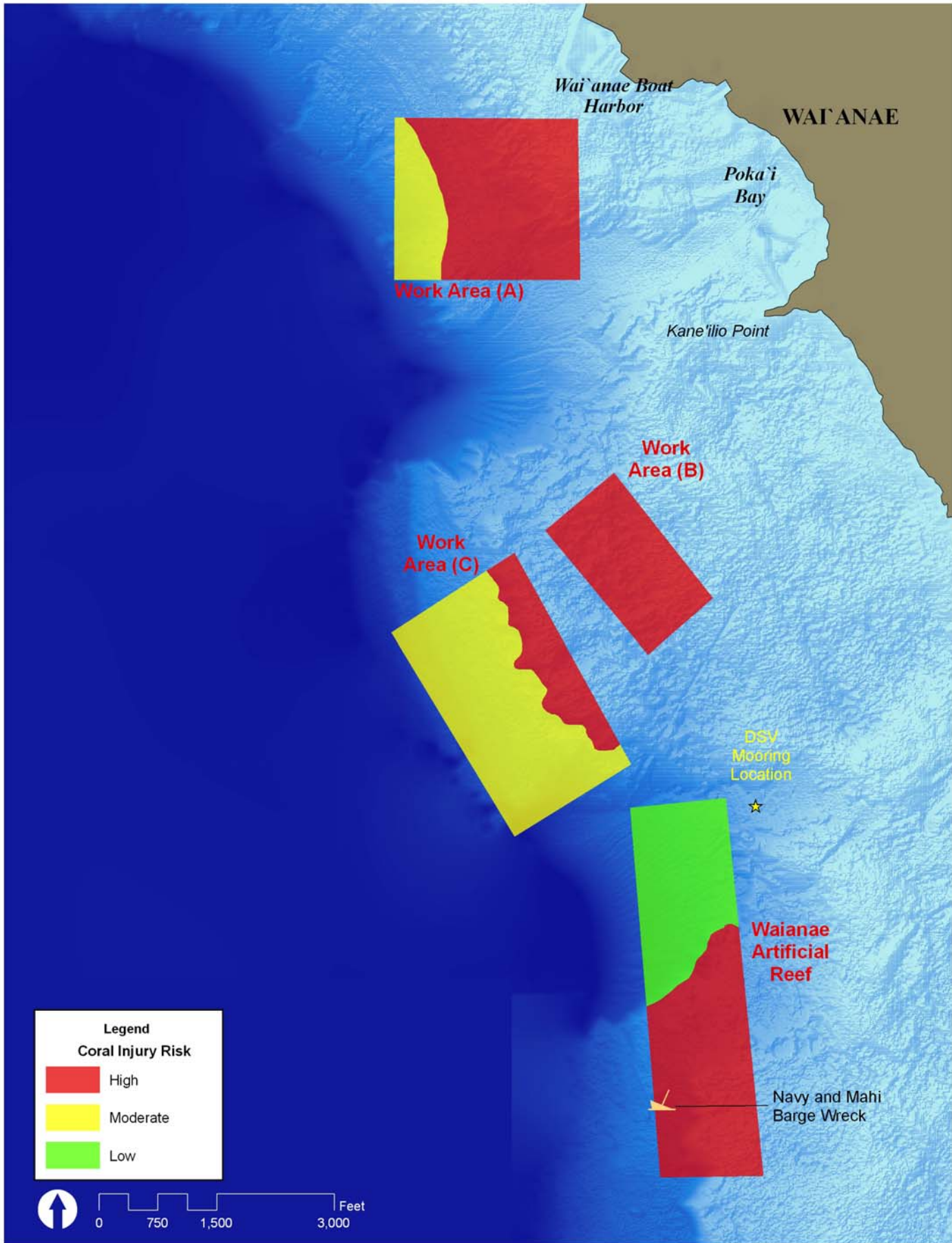
Under the No Action Alternative, the UWMM present at the Ordnance Reef (HI-06) at depths between approximately 30 and 120 feet would not be recovered, and environmental quality in the area would remain unchanged.

### ***Mitigation Measures***

Significant adverse impacts to corals are not anticipated as a result of the Proposed Action as the primary mitigation measure during the demonstration will be avoidance of corals. With some exceptions (e.g., SAA), ROUMRS will photograph UWMM before and during recovery, and also following recovery to allow any inadvertent damage to coral to be determined.

As previously described, ROUMRS is designed to allow the careful recovery of UWMM from the ocean's floor with minimal damage to the environment. However, some inadvertent damage to marine life, including corals, may occur during munitions operations. Therefore, ODASA(ESOH) has entered into an interagency agreement with NOAA to assist in preparing a Coral Avoidance and Minimization of Injury Plan (CAMIP) for the Proposed Action (Attached as Appendix C). The CAMIP reports the results of the pre-Demonstration survey of the coral reef ecosystem and munitions present. It addresses the relative risk of coral injury in the three Work Areas, and makes it possible to anticipate, in general, what Demonstration-related losses to coral may occur.

The Proposed Action will give priority to recovering munitions in areas of uncolonized hard bottom and sand while exercising due caution when working in areas of higher coral cover.



Source: NOAA, 2011

**Potential Coral Injury Risk From Mooring Activities**

**FIGURE 11**

When possible, recovery activities will avoid areas designated as having a moderate to high and high risk for coral injury and be limited to areas designated as having low and low to moderate risk. Furthermore, the DSV will moor only in an area designated as low risk (as shown in Figure 11).

The Army will consider a number of factors in determining whether to recover a particular munition. First, the Army will determine whether the munition is, from an explosives safety perspective, safe to move (recover). The Army will also consider whether there is sufficient space to maneuver the ROV and recover the targeted munitions without causing damage to coral or other benthic habitats. If substantial coral growth (12 inches or greater) is observed in a location where it could be damaged during recovery of a target munition, or if substantial coral growth (12 inches or greater) is observed on the target munition, the target munition will normally be left in place. Such a munition will only be removed if the Army determines that it is likely to pose an unacceptable explosive hazard to the public at some future date or, after consultation with NOAA, it is determined that the coral growth can be saved.

The CAMIP, comprises the first phase of NOAA's coral assessment efforts, and will be used by the Army and contractor for placement of moorings and anchorages and to guide the recovery efforts to avoid and minimize any impacts to coral. The CAMIP also includes a discussion of possible corrective mitigation measures, including emergency restoration efforts that can be undertaken to re-attach any corals that may become accidentally dislodged during recovery activities. The second phase of NOAA's coral assessment efforts will begin after UWMM recovery efforts have been completed and will include results of post-recovery survey efforts to document any injuries to corals resulting from the Proposed Action and recommendations for mitigation for those injuries. The third phase will involve the actual completion of coral mitigation activities by the Army, as necessary.

Should unintended injury to significant coral growth occur, the Army intends to take the appropriate measures (e.g., habitat replacement) necessary to restore the environment and mitigate any inadvertent damage. The Army will make a decision on whether mitigation measures are warranted upon completion of this roughly 21-day effort.

The Army has consulted and coordinated closely with NOAA throughout its efforts at Ordnance Reef (HI-06), particularly during planning. The Army will continue to work closely with NOAA and other state and federal agencies during and after the Proposed Action. In addition, NOAA will continue to provide the with Army pre-operational, operational, and post-operational support consisting of the following:

- Work Plan review and BMP approval – This pre-operational effort will add efficiency to ROUMRS UWMM recovery processes by providing ROV operators a relative risk evaluation of activities associated with ROV and mooring operations in the three Work Areas and the Artificial Reef.
- Pre-screen – NOAA is cataloging the type and locations of corals present at Ordnance Reef (HI-06) during this pre-operational effort. These surveys have focused on areas

where munitions are known to be present, based upon previous underwater surveys conducted. These surveys allow for the identification of relative coral abundance in the areas where the munitions are known to be located. This will assist in identifying appropriate locations for mooring and staging equipment as well as locations to avoid during ROV operations. The presence of any other marine life of concern will also be documented.

- Real time characterization – During the Proposed Action, NOAA will be able to review digital images that ROUMRS records during UWMM recovery operations providing for on the fly post-recovery verification and allowing for continuous improvement of methods employed to mitigate environmental impacts. These images will allow NOAA to determine what impact operations may be having on corals, if any. Because the ROUMRS ROV will have multiple camera angles and a real time positioning system, any injuries to large coral colonies (particularly colonies of *P. eydouxi*) during UWMM recovery activities can be reported to NOAA (Incl. photos of the larger injured colonies, and GPS coordinates). NOAA staff can then determine the feasibility of attempting emergency restoration measures consisting of reattaching any colonies that were broken off from the substrate (using cement or epoxy). Reattaching large colonies should enhance the corals chances of survival and should the colonies undergo mortality their skeletons would still contribute to local habitat complexity.
- Post-inspection/restoration – This post-operational effort will allow NOAA to assist the Army in assessing any ROUMRS-related impacts to corals and determining the need for a coral reef restoration or mitigation plan.

In addition to continued consultation and coordination efforts with NOAA and following recommendations set forth in the CAMIP (as practicable), all BMPs applicable to the prevention of adverse impacts to coral habitat shall be strictly adhered to per the BMPP. BMPs that will be implemented to minimize potential adverse impacts to corals include, but are not limited to:

- The ROV and topside crew will be briefed prior to ROV operations. The crew shall be briefed about:
  - Coral growth, reefs, marine life, protected marine species, and habitat that must be avoided.
  - Culturally important structures and locations.
  - Photographs, drawings, previous reports, and the NOAA CAMIP, which details the locations of sensitive corals and other benthic habitats and documents the relative level of concern for each Work Area.
- All coral species, including Branching Corals (*Pocillopora meandrina*, *Pocillopora eydouxi*, etc.) or Lobate Corals (*Porities lobata*, *Porities evermanni*, *Porities duerdeni*, etc.) greater than 12 inches in vertical growth that is either growing on a target object (i.e., UWMM) or in a location that could be damaged during recovery of the target object will be documented. Recovery of UWMM or munition debris with corals having greater than 12 inches of vertical growth will not occur until NOAA has been consulted about coral mitigation options (e.g., transplantation, habitat, replacement) and the Army

concur with the recovery. Any UWMM intentionally not recovered will be documented as to type, location, and reason for leaving it in place.

- Care will be taken when mooring or operating in areas of moderate relative coral abundance. Extreme care will be taken when mooring or operating in areas of high relative coral abundance. UWMM will normally be left in place if a highly developed coral reef system is present.
- Mooring, anchorage, and staging areas will be located using global positioning systems. The coordinates for each potential mooring, anchorage, and staging area must be confirmed prior to contacting the bottom.
- The ROV tether will:
  - Be manned at all times.
  - Have positive buoyancy to minimize bottom contact and possible disturbance of reef structures.
- The ROV will:
  - Be used to reconnoiter the position of mooring, anchorages, or staging areas prior to contacting the bottom to confirm that these areas are acceptable based on criteria provided in the CAMIP.
  - Exercise caution when approaching the mooring, anchorage, or staging areas to avoid contact with the bottom, environmental features, coral, or structures.
  - Be used to lower moorings, anchorages, or equipment to the bottom, or such will be lowered using lines. Moorings, anchorages, or equipment will not be dropped or released freely from the surface
  - Digitally record, document and save an image of the target location (i.e., the mooring, anchorage, or staging area) prior to contacting the bottom.
  - Avoid all coral species, protected marine species, reefs, and habitats of concern, and culturally important structures to prevent damage prior to and following placement of the mooring, anchorage, or equipment on the ocean bottom.
  - To the extent possible, limit contact with and avoid disturbance of the bottom while collecting munitions and munitions debris.
  - Confirm that the location and placement of the salvage basket is in an area that will not injure coral or other benthic habitat as noted in NOAA's CAMIP.
- Moorings and anchorages in sensitive locations will employ floated lines.
- Upon completion of work at each Work Area within Ordnance Reef (HI-06), the condition of the Work Area will be digitally recorded and saved after the mooring, anchorage, or staged equipment is removed. Any injury to sensitive areas will be identified and reported to the Army's lead.

### **3.1.2.2. Reef Fish**

#### **Existing Conditions**

There are 557 documented species of reef and shore fish in Hawai‘i. Of these species 135 are endemic and surgeonfish are the dominant fish group. Herbivores generally account for over 70 percent of the total reef fish biomass, followed by invertebrate feeders (13 percent) and plankton feeders (9.7 percent). Predators are rare, accounting for 3.8 percent of reef fish biomass (Brainard et.al., 2002).

The Wai‘anae coast has few locations with complex habitat. Thus, most of the reef along the coast has low species diversity and biomass. The Wai‘anae coast in general offers relatively few fish species and low numbers of fish. However, there are exceptions where large schools of reef fish have been documented. They include the three artificial reefs—Pōka‘ī Bay Artificial Shoal (created with old cars, concrete pipes and a steel barge in 1963), the Mahi shipwreck (sunk in 1982) and the seaplane wreck (sunk in 1986), the outfall pipe of the WWTP in Wai‘anae town; and the thermal outfall of the Kahe power plant just south of Wai‘anae (Kanenaka, 1991; Harrison, 1987).

The weke (yellowstripe goatfish; *Mulloidichthys flavolineatus*), na‘ena‘e (surgeonfish; *Acanthurus dussumieri*), ‘ū‘ū (menpachi; *Myripristis berndti*), and the saddleback wrasse (*Thalassoma duperrey*) occur in large schools at these sites. Also common are the brown surgeonfish (*Acanthurus nigrofuscus*), Pacific Gregory (*Stegastes fasciolatus*), goldring surgeonfish (*Ctenochaetus strigosus*) and the blackfin chromis (*Chromis vanderbilti*). Moray eels belong in the family Muraenidae in the genus *Gymnothorax*. These eels are common apex predators with 38 species of morays found on Hawaiian reefs. Individuals are resident to specific reef areas, and feed on a wide range of reef associated fish and invertebrates (NOAA, 2007).

Armor rock surrounding pipes and artificial reefs provides ample habitat space for hiding and mating, ample surface for the colonization of food sources, and a reference point above the seafloor for aggregation and maintenance of schools. Artificial structures placed in areas normally devoid of bottom relief can attract large numbers of fish and provide surfaces for coral and other sessile organism attachment. Macroalgae represent over 50 percent of the benthic cover in the Hawaiian coral reef ecosystem. Red algae are the most commonly occurring algae in Hawai‘i, representing four of the five most common species. Green and brown algal species are found in most reefs in smaller numbers (Brainard, et. al., 2002; NOAA, 2007).

#### **Potential Impacts**

##### ***Proposed Action***

Significant adverse impacts to reef fish and marine life would not occur as a result of the Proposed Action. However, potential less than significant impacts could occur from the accidental release of MC from UWMM, or accidental fluid spills from equipment. An indirect beneficial impact resulting from the Proposed Action would be the limited recovery of UWMM



between approximately 30 and 120 feet of depth, and the return of the marine environment within the Demonstration Site to a more natural state.

Potential impacts resulting from the Proposed Action do not meet the significance criteria or such impacts that can be effectively mitigated would not result in significant adverse impacts to reef fish and marine life.

### *No Action Alternative*

Under the No Action Alternative, the UWMM present at the Ordnance Reef (HI-06) at depths between approximately 30 and 120 feet would not be recovered, and environmental quality in the area would remain unchanged.

### *Mitigation Measures*

Under the BMPP, the Army and its contractors will strictly adhere to applicable BMPs to prevent adverse impacts to fish and other marine resources within Ordnance Reef (HI-06) throughout the Proposed Action. BMPs that will be implemented to minimize potential adverse impacts to fish and marine resources would include, but not be limited to those previously described in sections 3.1.1. and 3.1.2.2.

### **3.1.2.3. Protected Species**

Since 1973, the ESA has regulated a wide range of activities affecting flora and fauna classified as endangered or threatened. Reauthorized in 1988, the provisions of the ESA apply only to species listed in the Federal Register as endangered or threatened. Under the provisions of the ESA, all federal agencies are required to undertake measures to protect and conserve threatened and endangered species during the execution of their missions and are prohibited from authorizing, funding, or carrying out any action that would jeopardize a listed species or destroy or alter their critical habitat.

A species is classified as "endangered" when it is in danger of extinction within the foreseeable future in all or a significant portion of its range. A "threatened" classification is assigned to a species likely to become endangered within the foreseeable future in all or a significant portion of its range.

### **Existing Conditions**

Several protected marine species occur within the main Hawaiian Islands. Below is a brief summary of protected marine species known to use the waters off Oʻahu, including its leeward coast.

- Marine Mammals – Humpback whales appear in Hawaiian waters between November and April, when they socialize, mate, and give birth. When engaged in singing, nursing, or competition for mates, whales can become very vulnerable to human hazards because their attention is focused on these reproductive activities. Humpback whales migrate

annually from Alaska to Hawaiian waters, covering nearly 3,000 miles of open-ocean in less than two months' time. Approximately 2,000 to 5,000 individuals come to Hawaiʻi each year, constituting a substantial portion of the total North Pacific population of 6,000 to 10,000 whales (NOAA, 2007). Humpback whales are an endangered species protected under both the MMPA and the ESA.

The Hawaiian Islands Humpback Whale National Marine Sanctuary was established to protect the largest breeding grounds for the humpback whale, and includes near shore waters along parts of all the main Hawaiian Islands including the northern coast of Oʻahu. Neither Ordnance Reef (HI-06) nor the Waiʻanae coast is located within the Hawaiian Islands Humpback Whale National Marine Sanctuary boundary.

Within the Hawaiian Archipelago spinner dolphins (*Stenella longirostris longirostris*) are found around all of the main Hawaiian Islands and are also found at some of the Northwest Hawaiian Islands (e.g., Midway, Kure, Pearl and Hermes Reef and French Frigate Shoals). However, in contrast to the Northwest Hawaiian Islands, the main Hawaiian Islands are large and offer many potential resting areas for spinner dolphins (NOAA, 2010).

The Hawaiian monk seal (*Monachus schauinslandi*), a federally listed endangered species, most commonly inhabits the Northwestern Hawaiian Islands. However, monk seals are occasionally sighted around the main Hawaiian Islands, including off Mākuā Beach on the Waiʻanae coast. Prominent threats to monk seal populations include entanglement in fishing gear; disturbance by humans, which can cause seals to abandon haul-out areas and their pups; and predation by sharks.

- Sea Turtles – The green sea turtle (*Chelonia mydas*), considered the most abundant sea turtle in Hawaiian waters, is listed as a threatened species under the federal ESA. These turtles can be seen in the waters off Waiʻanae. Threats to green sea turtles occur from land-based and sea-based activities, such as the loss of nesting habitat due to development, nest predation, boat collisions, entanglement in fishing gear, and ingestion of marine pollution.

Hawksbill turtles are distributed throughout the tropics, generally occurring at latitudes from 30 degrees north to 30 degrees south within the Atlantic, Pacific, and Indian Oceans and associated bodies of water. In Hawaiʻi, hawksbills nest only on main Hawaiian Island beaches, primarily along the east coast of the island of Hawaiʻi. The hawksbill turtle is listed as endangered throughout its range. In the Pacific, this species is rapidly approaching extinction due to a number of factors, but the intentional harvest of the species for meat, eggs, shell, and stuffed curio trade is of greatest impact (NOAA, 2007).

- Corals – At the time of the writing of this EA, coral species are not protected under the ESA. However, pursuant to a petition filed by the Center for Biological Diversity (CBD) on October 20, 2009, the NMFS is currently reviewing the candidacy of 82 species of coral for listing as threatened or endangered under the ESA. A Notice of 90-Day Finding on the subject petition was published by the NMFS in the Federal Register on February 10, 2010 (FR, 2010).

The species petitioned are all corals identified by the World Conservation Union (IUCN) as vulnerable, threatened, endangered, or critically endangered. Of the 82 species under consideration, the IUCN has classified 75 as vulnerable, six as endangered, and one as critically endangered. Seventy-five (75) of the species occur in the Indo-Pacific and seven occur in the Caribbean-Atlantic region. All of the coral species can be found in the US and its territories. However, many occur more frequently in other countries (CBD, 2009).

Of the 75 corals species occurring in the Indo-Pacific region, nine species are found in the Hawaiian Islands. These are: *Acropora paniculata*, *Cyphastrea agassizi*, *Cyphastrea ocellina*, *Leptoseris incrustans*, *Montipora dilatata*, *Montipora flabellata*, *Montipora patula*, *Pocillopora elegans*, and *Psammocora stellata*. However, of these nine species found in Hawai‘i none are known to occur within Ordnance Reef (HI-06) or along the Wai‘anae coast.

## **Potential Impacts**

### ***Proposed Action***

Significant adverse impacts to protected marine species are not anticipated as a result of the Proposed Action. As previously noted, neither Ordnance Reef (HI-06) nor the Wai‘anae coast is located within the Hawaiian Islands Humpback Whale National Marine Sanctuary boundary. Furthermore, the Proposed Action is scheduled to take place during the summer months of 2011, which fall outside of whale season (November through April). However, there exists the possibility of encountering some protected species, in particular green sea turtles, at Ordnance Reef (HI-06).

The NMFS has confirmed that there is no designated or proposed critical habitat for any listed marine species with or adjacent to the proposed demonstration area. Therefore, the Proposed Action would have no affect of designated or proposed critical habitat for marine species (Appendix F).

An indirect beneficial impact resulting from the Proposed Action would be the limited recovery of UWMM between approximately 30 and 120 feet of depth, and the return of the marine environment within the Demonstration Site to a more natural state.

Potential impacts resulting from the Proposed Action do not meet the significance criteria, or can be effectively mitigated, and would not result in significant adverse impacts to protected species.

### ***No Action Alternative***

Under the No Action Alternative, the demonstration and resultant potential adverse impacts to protected species would not occur.

### ***Mitigation Measures***

Under the BMPs, the Army and its contractors will strictly adhere to applicable BMPs to prevent impacts to protected species during implementation of the Proposed Action within Ordnance Reef (HI-06). BMPs that will be implemented to minimize potential adverse impacts to ESA and MMPA protected species would include, but not be limited to:

- All on-site Demonstration-related personnel will be apprised of the status of any ESA-listed or MMPA-protected species potentially present in the work area and the protections afforded these species under Federal laws.
- Constant vigilance will be kept for the presence of ESA-listed or MMPA-protected marine species during all aspects of the Proposed Action, particularly in-water activities such as ROV and support vessel operations, diving, and mooring and anchoring activities.
- A competent observer will be designated to survey the marine areas adjacent to the Proposed Action for ESA-listed or MMPA-protected marine species.
- Visual surveys will be made prior to the start of work each day, and prior to resumption of work following any break of more than one half-hour. Additional periodic surveys throughout the workday would be conducted.
- The designated Demonstration points of contact for in-water activities will ensure that observers are in place and protocols are followed during all periods of in-water work to avoid any potential contact with, or harassment of ESA-listed or MMPA-protected species.
- Records of any protected species observed in the Demonstration areas during in-water activities will be maintained and submitted at the close of in-water activities.
- All in-water work will be postponed or halted when ESA-listed or MMPA-protected marine species are observed within 210 feet (64 meters) of the proposed work, and will only begin or resume after the ESA-listed or MMPA-protected species has voluntarily departed the area. If ESA-listed or MMPA-protected species are observed within 210 feet (64 meters) of the proposed work after the work has already begun, such work can continue only if, in the best judgment of the Demonstration Manager, the work will in no way adversely affect the ESA-listed or MMPA-protected marine species.
- When piloting vessels, vessel operators will:
  - Alter course to remain at least 300 feet (91 meters) from whales, and at least 210 feet (64 meters) from other marine mammals and sea turtles.
  - Reduce vessel speed to 10 knots or less when piloting vessels at or within the ranges described above from marine mammals and sea turtles. Operators will be particularly vigilant to watch for turtles at or near the surface in areas of known or suspected turtle activity, and if practicable, reduce vessel speed to 5 knots or less.
  - If, despite efforts to maintain the distances and speeds described above, a marine mammal or turtle approaches the vessel, put the engine in neutral until the animal is at least 50 feet away then slowly move away to the prescribed distance.

- Marine mammals and sea turtles will not be encircled or trapped between multiple vessels or between vessels and the shore.
- Attempts to feed, touch, ride, or otherwise intentionally interact with any ESA-listed marine or MMPA-protected species by personnel involved in the Proposed Action will be prohibited.

In the unlikely event that any ESA or MMPA listed species are harmed, injured or killed the Army shall immediately cease operations and notify the NMFS Protected Resources Division. Mitigation measures for the protection of coral species are contained within the BMPs found in Appendix B. The Army will reinitiate consultation with NMFS if any of the following conditions occur:

- A take occurs,
- New information reveals the action has affected protected species in a manner or to an extent not previously evaluated,
- If the action is subsequently modified and causes effects to protected species in a manner or to an extent not previously considered or evaluated, or
- A new species is listed or critical habitat is designated that may be affected by the authorized work.

### **3.1.3. Air Quality**

Ambient air pollution concentrations are regulated by both federal (Section 40, Part 50 CFR) and state (Hawai'i Revised Statutes (HRS), Chapter 11-59) Ambient Air Quality Standards (AAQS). Federal AAQS are divided into primary and secondary standards. The primary standards are intended to protect the public with an adequate margin of safety, while secondary standards are intended to protect public welfare through the prevention of damage to soils, water, vegetation, animals, wildlife, man-made materials, visibility climate and economic values (40 CFR, Part 50). State AAQS are intended to "protect public health and welfare and to prevent the significant deterioration of air quality" (State of Hawai'i, 2001).

The US Environmental Protection Agency (EPA) has promulgated federal AAQS, which include six criteria pollutants: carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), sulfur dioxide (SO<sub>2</sub>), lead (Pb), ozone (O<sub>3</sub>), and particulate matter (PM). However, monitoring for lead was no longer required after October 1997. In addition to the federal standards, Hawai'i has established standards for CO and NO<sub>2</sub> that are more stringent than the federal AAQS and has also set an ambient air standard for hydrogen sulfide.

Table 3-1 summarizes both the federal and state AAQS. Each regulated air pollutant has the potential to adversely impact human health or to produce environmental degradation when present in sufficiently high concentrations for prolonged periods of time. Additionally, the state's Air-Pollution Control Regulations also prohibit visible emissions at the property line of fugitive dust from concentration activities (State of Hawai'i, 2001).

**Table 3-1. Summary of State of Hawai‘i and Federal Ambient Air Quality Standards**

<b>Pollutant</b>	<b>Sampling Period</b>	<b>National AAQS Primary</b>	<b>National AAQS Secondary</b>	<b>State of Hawai‘i AAQS</b>
Particulate Matter (PM <sub>10</sub> ) <sup>a</sup>	Annual 24 hour	-- 150 µg/m <sup>3</sup>	-- 150 µg/m <sup>3</sup>	50 µg/m <sup>3</sup> 150 µg/m <sup>3</sup>
Particulate Matter (PM <sub>2.5</sub> ) <sup>b</sup>	Annual 24 hour	15 µg/m <sup>3</sup> 35 µg/m <sup>3</sup>	15 µg/m <sup>3</sup> 35 µg/m <sup>3</sup>	-- --
Sulfur Dioxide (SO <sub>2</sub> )	Annual	0.03 ppm	--	0.03 ppm
	24 hour	0.14 ppm	--	0.14 ppm
	3 hour	--	0.5 ppm	0.5 ppm
Nitrogen Dioxide (NO <sub>2</sub> )	1 hour	75 ppb	--	--
	Annual	0.053 ppm	0.053 ppm	0.04 ppm
	1 hour	100 ppb	--	--
Carbon Monoxide (CO)	8 hour	9 ppm	--	4.4 ppm
	1 hour	35 ppm	--	9 ppm
Ozone (O <sub>3</sub> )	8 hour	0.075 ppm	0.075 ppm	0.08 ppm
Hydrogen Sulfide	1 hour	--	--	25 ppb
Lead (Pb)	Quarterly	0.15 µg/m <sup>3</sup>	--	1.5 µg/m <sup>3</sup>

<sup>a</sup> Particles are less than or equal to 10 microns aerodynamic diameter.

<sup>b</sup> Particles are less than or equal to 2.5 microns aerodynamic diameter.

Source: DOH, 2010

ppb = parts per billion by volume

ppm = parts per million by volume

µg/m<sup>3</sup> = micrograms per cubic meter of air

### **Significance Criteria**

Impacts on air quality are considered significant if any of the following apply:

- Violates any air quality standard or exceeds de minimis levels to an existing or projected air quality violation, including normal operational and accidental releases;
- Results in a cumulatively substantial net increase of any criteria pollutant for which the project region is in nonattainment under an applicable federal or state AAQS;
- Exposes the public to substantial pollutant concentrations that are above acceptable health effects levels as established by state or federal regulations; or
- Conflicts with or obstructs implementation of any applicable federal, state, or local air quality plan.

### **Existing Conditions**

Air quality at Ordnance Reef (HI-06) is considered good as it is in a coastal area and influenced heavily by circulating ocean winds. The rural nature of the adjacent Wai‘anae community and the absence of nearby major sources of industrial or vehicular emissions further contributes to the good air quality of the region.

The state of Hawai‘i Department of Health (DOH) maintains a limited network of air monitoring stations around the state to gather data on the pollutants listed in Table 3-1 above. There are six DOH air monitoring stations on the island of O‘ahu. Monitoring stations nearest Ordnance Reef (HI-06) are West Beach, Ko‘olina Golf Course Station and the Kapolei Station, located approximately 8 and 10 miles south of Ordnance Reef (HI-06), respectively.

The most recent published air quality data from the West Beach and Ko‘olina monitoring stations is presented in Table 3-2 below. These data are indicative of the generally good air quality throughout most of Hawai‘i and may be considered reasonable representative of existing air quality in the area that encompasses Ordnance Reef (HI-06).

**Table 3-2. DOH Air Quality Data at Monitoring Stations Near Ordnance Reef (HI-06) 2009**

Pollutant	Concentration
Particulate Matter (PM <sub>10</sub> )	
24-hour (max)	28 µg/m <sup>3</sup>
Annual	13 µg/m <sup>3</sup>
Particulate Matter (PM <sub>2.5</sub> )	
24-hour (max)	20 µg/m <sup>3</sup>
Annual	3.5 µg/m <sup>3</sup>
Sulfur dioxide (SO <sub>2</sub> )	
3-hour (max)	0.006 ppm
24-hour (max)	0.002 ppm
Annual	0.001 ppm
Carbon monoxide (CO)	
1-hour (max)	3.8 ppm
8-hour (max)	0.8 ppm
Annual	0.2 ppm
Ozone (O <sub>3</sub> )	
8-hour (max)	0.036 ppm
Annual	0.013 ppm
Nitrogen Dioxide (NO <sub>2</sub> )	
Annual	0.003 ppm

Notes: 1. CO, NO<sub>2</sub>, and PM<sub>2.5</sub> are from the Kapolei station  
2. O<sub>3</sub> data are from the Sand Island monitoring station

Source: DOH, 2009

As shown in the table above, ambient air quality in the vicinity of Ordnance Reef (HI-06) is very good with criteria pollutant concentrations falling well below both the state and federal AAQS thresholds.

## **Potential Impacts**

### ***Proposed Action***

No significant impacts to air quality are anticipated as a result of the Proposed Action. EHDS operations on the DSV would result in emissions from the RCBO. The EHDS is not a major stationary source of emissions, and EHDS-related emissions would be negligible, short-

term, and localized in nature. A detailed description of the energetic compounds and decomposition products (including emissions) resulting from the EHDS process can be found in Appendix L (Section VII). Furthermore, the DSV would be located approximately two miles off shore and any emissions would be readily dispersed out at sea.

The DOH - Clean Air Branch was consulted regarding the Proposed Action, and in a letter (dated July 15, 2010) issued an Air Permit Exemption (see Appendix D) for the operation of the EHDS-RCBO.

Potential impacts resulting from the Proposed Action would be less than significant and would not result in long-term adverse impacts to air quality.

#### ***No Action Alternative***

Under the No Action Alternative, the Proposed Action would not occur and there would be no impact to ambient air quality.

#### ***Mitigation Measures***

No mitigation measures are required.

#### **3.1.4. Noise Environment**

The impacts of sound on the environment are determined by several factors including sound level (loudness), the duration of exposure to the noise, the frequencies involved, and the variation or fluctuations in noise levels during exposure. Loudness is measured in units called decibels (dB).

When describing underwater acoustic phenomena it is normal to express the sound pressure through the use of a logarithmic scale termed the Sound Pressure Level or SPL. The SPL is usually expressed using the logarithmic dB scale. The fundamental unit of sound pressure is the Newton per square meter, or Pascal. Underwater sound is conventionally presented in dB referenced to 1 microPascal ( $\mu\text{Pa}$ ), and is expressed as dB re 1  $\mu\text{Pa}$  (ICES, 2005).

#### **Significance Criteria**

For the purposes of this EA sound-related impacts could be considered significant if the Proposed Action results in:

- A substantial permanent or long-term increase in ambient noise levels in the surface environment in the vicinity of the project, above levels existing without the project;
- A substantial permanent or long-term increase in ambient noise levels in the subsurface environment in the vicinity of the project, above levels existing without the project, that may result in permanent, irreversible damage to marine biota; or



- Noise levels exceeding the local noise ordinance or any applicable noise regulations promulgated on the federal or state level at upland locations such as parks, recreational areas, residences, or schools.

### **Existing Conditions**

Due to its off-shore location, surface ambient sound levels at Ordnance Reef (HI-06) are primarily controlled by the naturally occurring sounds of open ocean waves and wind. In the northeastern portion of Ordnance Reef (HI-06), closest to Pōkaʻī Bay and the WSBH, dispersed and intermittent sounds of recreational and commercial ocean vessels and recreational ocean users also influence ambient sound levels, and to a lesser degree harbor activities. Harbor activities include onsite motor vehicles, and ocean vessel docking activities. The noise generated from harbor operations are for the most part not radiated beyond the harbor property boundaries.

Subsurface background, or ambient, noise occurs in all oceans and seas. There are many sources of ambient noise, which may be classified as either:

- Physical – wind driven, turbulence, seismic (earthquakes, etc.) and microseisms, thermal, rainfall, seabed generated and icebergs;
- Biological – human and animal sounds and movement; and
- Man-made – shipboard machinery, propeller, water flow around, and discharges from, the hull.

These diverse sources all contribute to the generation of underwater background ambient noise levels (ICES, 2005). The subsurface ambient noise environment within Ordnance Reef (HI-06) would also be influenced by similar physical, biological, and man-made sources, due to its location along the Waiʻanae coastline and its proximity to the WSBH and public beaches.

In areas farther off-shore (i.e., outside the surf zone along shorelines), ambient noise is often as low as 35 - 70 dB re 1  $\mu$ Pa; during times of high wind and storms, wave noise alone can increase to over 80 dB. Dense animal or shipping noise can peak as high as 140 dB re 1  $\mu$ Pa at very low frequencies (below 10 Hz), 100 dB re 1  $\mu$ Pa at frequencies up to 1 kHz, and 60 dB re 1  $\mu$ Pa at frequencies over 1 kHz. Other more recent studies have shown individual supertankers being as loud as 189 dB re 1  $\mu$ Pa at low frequencies, with most large ships having individual source levels between 160 and 180 dB re 1  $\mu$ Pa (AEI, 2001).

Many marine animals rely on hearing for a wide variety of critical functions, and exposure to prolonged and/or excessive noise could adversely impact them. However, determining potential underwater sound-related impacts to marine life is difficult. Hearing loss due to sound exposure is well studied in humans and other terrestrial animals, but data for marine animals are sparse (USN, 2007).

Although there are many data gaps regarding auditory impacts to marine animals, the present scientific consensus is that problems in a marine mammal's hearing capability will not arise at source levels of less than 180 dB re 1  $\mu$ Pa. At higher received levels or greatly extended continuous duration one cannot be certain, and the general consensus is that the 180 dB re 1  $\mu$ Pa

level should be considered as the point above which some potential problems in marine mammals' hearing capability may begin to occur (USN, 2007).

## **Potential Impacts**

### ***Proposed Action***

The ROUMRS and EHDS technologies will emit sound both above and below the water surface during munitions recovery and disposal operations. Adverse impacts to the noise environment above the water surface would be negligible to non-existent. The mechanized sound levels generated by the technology demonstration activities on the water surface would be both comparable and consistent with existing at-sea activities and operations of recreational and commercial ocean vessels that use the area. Furthermore, noise generated during the Proposed Action would occur in remote off-shore areas, and would be temporary, and short-term in nature.

The ROUMRS will also generate underwater noise from its propulsion system, mechanized recovery equipment, and SONAR from its reconnaissance surveying, and acoustic navigation systems. Source level noise generated by the ROUMRS sonar scanning and acoustic navigation systems would be 210 dB re 1  $\mu$ Pa and 190 dB re  $\mu$ Pa, respectively.

Although the sound levels generated by these ROUMRS scanning and navigation systems are greater than 180 dB re 1  $\mu$ Pa, significant adverse impacts to the underwater noise environment are not anticipated, because these sound levels would be generated intermittently and over a short period of time. The referenced decibel levels can occur if the equipment is operated at full power which is not part of the standard operating procedure, and may occur infrequently if at all. Furthermore, the ROUMRS was designed using off-the-shelf commercially available ROT. Consequently, the sound levels generated fall within common sound level ranges for non-military, commercial bathymetric, depth-finding sonar equipment which often have source levels of 220 dB or 230 dB re 1  $\mu$ Pa (ICES, 2005).

In addition, to operational noise generated by ROUMRS impulsive sound could be generated as a result of unintentional underwater detonation of munitions. Powerful impulsive noise is generated by the use of explosives underwater, by the airgun arrays used in seismic surveying, and by some forms of construction activity such as underwater pile driving. These sources generate impulsive waves of short duration, high peak pressure, and a wide frequency bandwidth, and may consequently represent a hazard to underwater animals.

Significant adverse impacts from explosion-related impulsive sound are not likely to occur, because as previously discussed the chances of the unintentional detonation of unfired, unarmed, and unfuzed sea-disposed munitions is remote. Furthermore, if such an unlikely detonation event were to occur, the resultant impulsive sound generated would be an isolated, singular, short-term event as opposed to a repetitive event of long-term duration (e.g., underwater pile driving).

In summary, potential sound impacts resulting from the Proposed Action would be short-term and temporary in nature. They do not meet the significance criteria, and would not result in significant adverse impacts to the noise environment.

### *No Action Alternative*

Under the No Action Alternative, the demonstration would not occur and there would be no impact to the surrounding noise environment.

### *Mitigation Measures*

Although significant adverse underwater sound impacts are not anticipated, as a precautionary measure, in-water activities during the Proposed Action will employ, as practical and feasible as possible, sound attenuation measures (not operating the ROV at full power) to minimize the intensity and duration of percussion impacts through the aquatic environment.

## **3.2. Social Environment**

### **3.2.1. Public Health and Safety**

#### **Significance Criteria**

Any impact on public safety from Proposed Action would be considered significant if it resulted in:

- Loss of life or serious injury to both people involved with and/or not involved with the project;
- The cause and/or transmittal of chronic disease or physical illness to the public; or
- Long-term damage to the environment.

#### **Existing Conditions**

As previously noted, UWMM present at Ordnance Reef (HI-06) are believed to be discarded there by DoD sometime after World War II. These military munitions are both numerous and varying in types and size. UWMM documented at the Ordnance Reef (HI-06) include, but may not be limited to: naval gun ammunition, 105mm and 155mm artillery projectiles, mines, mortars, and SAA (i.e., ammunition, without projectiles that contain explosives (other than tracers), that is .50 caliber or smaller, or for shotguns).

#### **Potential Impacts**

##### ***Proposed Action***

Beneficial impacts to public safety and health would occur as a result of the Proposed Action. UWMM are often encountered and investigated by recreational divers, and the limited recovery of UWMM from approximately 30 to 120 feet of depth would reduce the potential

human health and safety risks associated with divers moving, disturbing or attempting to recover UWMM as souvenirs, for scrap value, or for other purposes.

Adverse impacts to public health and safety could potentially occur if an unintentional detonation occurs. However, the chances of an unintentional detonation event during the Proposed Action are extremely low. As previously discussed, UWMM at Ordnance Reef (HI-06) are categorized as DMM. As such, these munitions pose less of an explosives hazard than UXO because, even if fuzed, these munitions have not been armed as a result of being used as intended. Nevertheless, an unintentional detonation of UWMM that has been brought to the surface could pose a risk to public health and safety in the form of blast and fragment hazards.

Potential impacts resulting from the Proposed Action, do not meet the significance criteria, and would not result in significant impacts to public health and safety.

### *No Action Alternative*

Under the No Action Alternative, the current situation would remain unchanged, and the potential for adverse impacts to public health and safety could occur in the event UWMM are encountered, investigated, or disturbed by recreational divers.

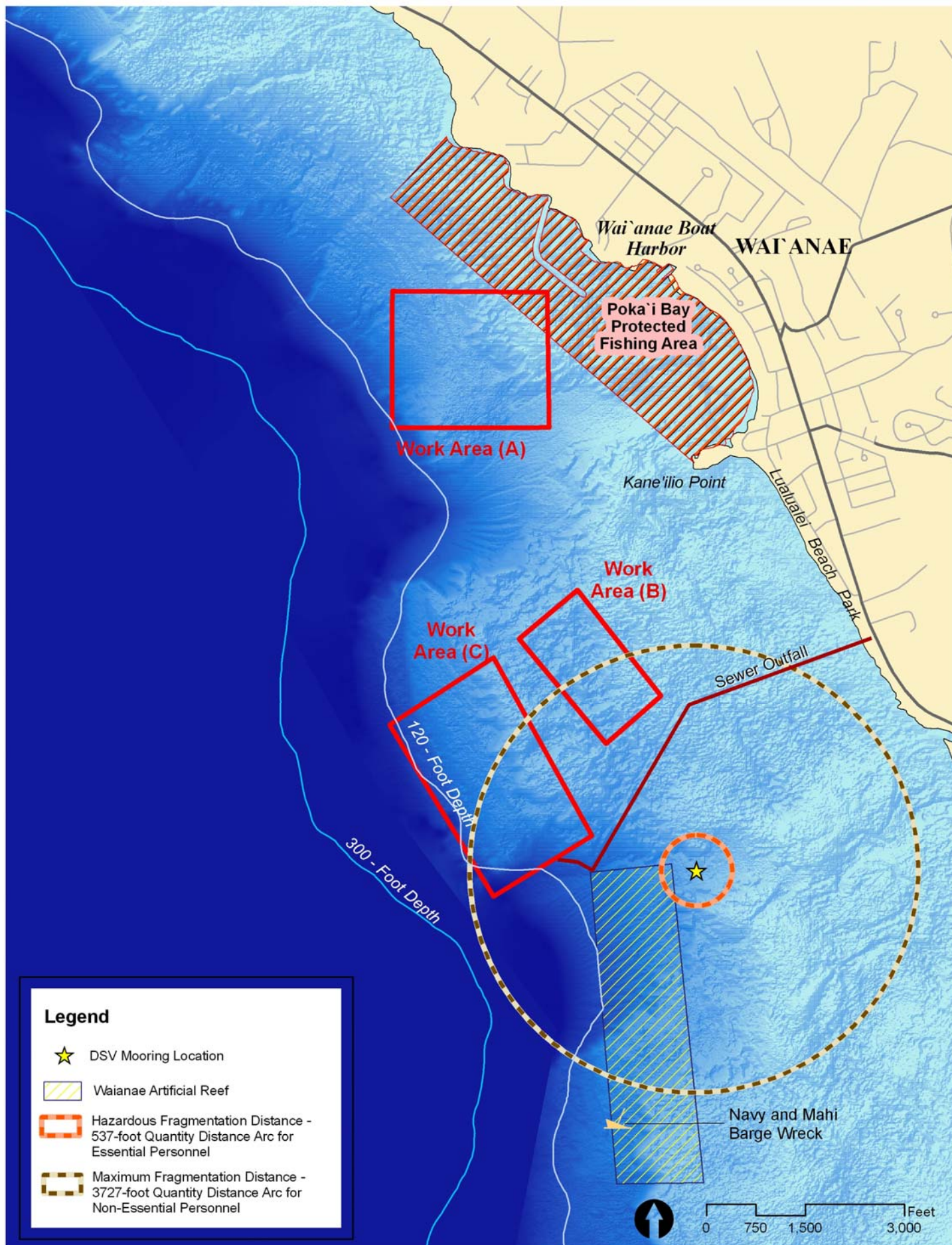
### *Mitigation Measures*

DoD has established explosives safety criteria to protect the public from the potential explosives hazards associated with various quantities and types of munitions. One of these criteria is the establishment of explosives safety zones. These safety zones, which are referred to as Explosive Safety Quantity Distance (ESQD) arcs, vary in distance based on the net explosive weight (NEW) of any munitions present at a given location. An EQSD is determined based on either a planned NEW—normally the maximum NEW that would be allowed—or on the actual NEW present. An ESQD radiates from the outer edges of any munitions present.

The ESQD required for the Proposed Action will be approved by the USATCES, and separately by the DDESB. As a mitigation measure, when munitions containing high explosives are being processed, an ESQD of 537 feet and 3,727 feet will be maintained around the DSV for essential and non-essential personnel, respectively (ARA, 2011).

The ESQD will be maintained as a restricted exclusion zone by use of small contracted craft to keep people and vessels out of the ESQD (safety zone). The ESQD perimeter will not intersect with beaches, public lands, or roadways. The ESQD locations and size are shown in Figure 12.

To minimize potential explosive risks to the public, all demilitarization activities, with the exception of removal from the ROUMRS' salvage baskets, will be performed inside 20-foot steel shipping containers, shielded with blast and fragmentation barriers that are designed to withstand and direct the forces of an intentional detonation. During ROUMRS DMM recovery and towing activities, an ESQD of 254 feet will be maintained around the ROV, salvage basket, and RSV for non essential personnel (ARA, 2011).



**Explosive Safety Quantity Distance (EQSD)**

**FIGURE 12**



All demilitarization activities will be performed per the ESSP developed per applicable Army and DoD Ammunition and Explosives Safety Standards. The ESSP will be reviewed and approved by USATCES and separately by the DDESB. As previously mentioned, the ESSP is currently in its draft form but, will be approved and finalized prior to initiation of Demonstration activities. Additionally, the parameters of the ESSP and related plans will be closely coordinated with the US Coast Guard, and the WSBH’s Harbormaster.

### **3.2.2. Marine Recreational Resources**

#### **Significance Criteria**

For the purposes of this EA, impacts to recreational resources would be considered significant if the project activities:

- Conflict with existing or future area wide or local recreational policies or plans;
- Permanently alter, diminish, or eliminate a marine recreational resource;
- Substantially reduce the quality of the recreational experience (e.g., project activities degrade the character of a recreational area); or
- Create incompatible adjacent marine uses.

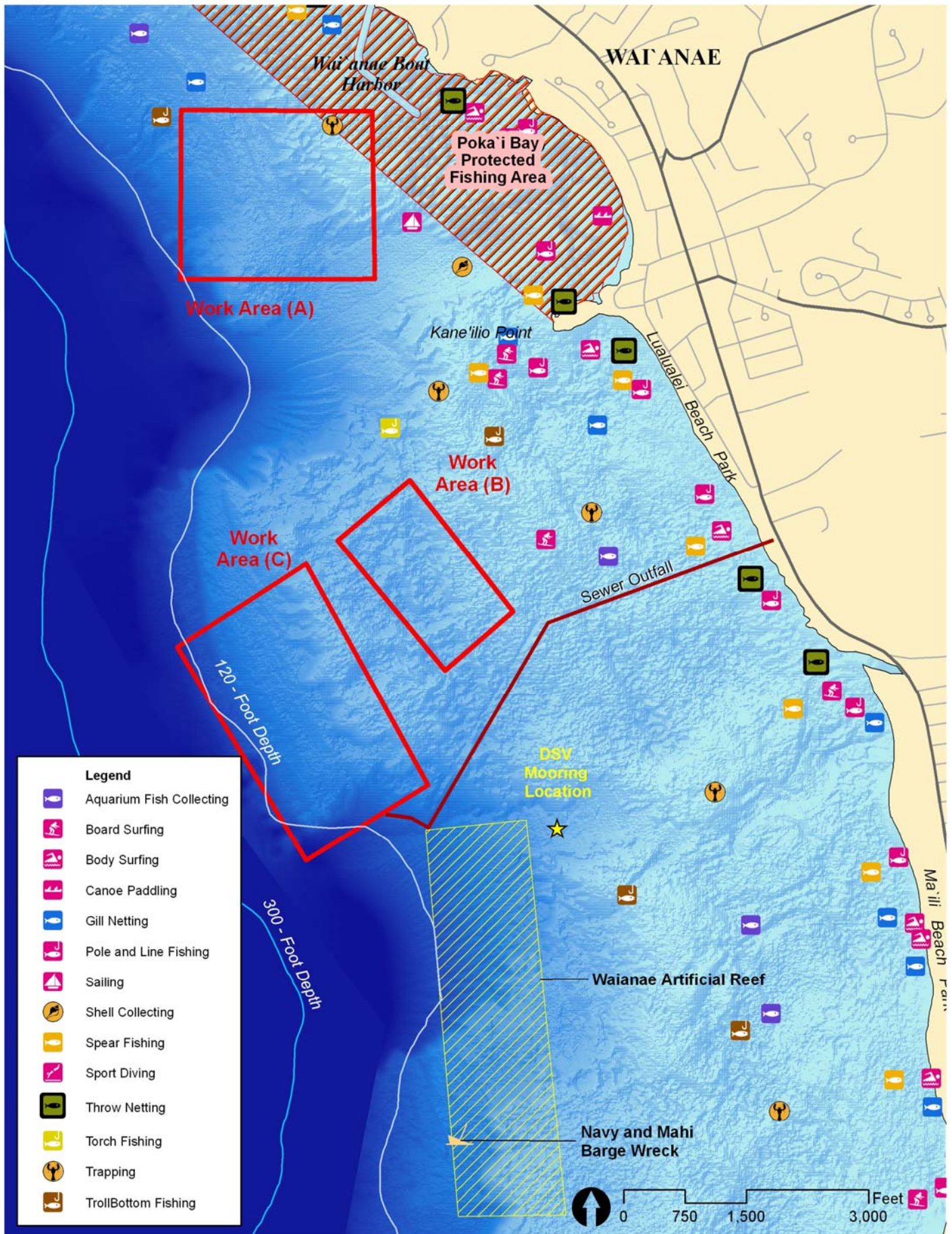
#### **Existing Conditions**

The Wai‘anae coast, which extends from Ka‘ena point to Kahe point, provides diverse opportunities for marine recreational opportunities, including among others, fishing (off-shore and near-shore), surfing, diving, snorkeling, spear fishing, canoe paddling, and swimming (shown in Figure 13). There are numerous public beach parks and harbor facilities along the Wai‘anae coast that provide access to these recreational activities.

Private and commercial vessels operating along the Wai‘anae coast provide access to a ocean recreational activities, which include fishing, snorkeling, SCUBA diving, and sightseeing tours to watch spinner dolphins and humpback whales.

The WSBH is just off Farrington Highway and adjacent to the Wai‘anae Regional Park. The WSBH was constructed in 1972, and owned and operated by the state of Hawai‘i DLNR-Division of Boating and Ocean Recreation (DOBOR). The harbor has 146 slips, 94 of which are occupied. The harbor also has seven boat launching ramps, a vessel washdown area, a fish hoist, and a marine sanitation device pumpout facility. The WSBH is one of Oahu’s main small boat and ramp facilities, thus at times it can be quite busy (DOBOR, 2009).

- Public Beaches – Approximately 18 miles of the Wai‘anae coast consists of beach parks and community recreation areas. These parks and recreation areas provide access to the shoreline for coastal recreational activities including swimming, fishing (throw netting, pole and line fishing, spear fishing, etc.), snorkeling, surfing, canoe paddling, seaweed picking and shell collecting (NOAA, 2007).



Source: DOBOR, 2009

**Ocean Recreational Resources**

EA for Technology Demonstration: ROUMRS and EHDS at Ordnance Reef (HI-06)

**FIGURE 13**

Wai'anae, O'ahu, Hawaii

- **Surfing** – The surf conditions along the Wai‘anae coast benefit from a westerly swell, and the coast is also well-oriented to pick up waves from the north and south, making it one of the premier year-round surf locations. Numerous board surfing and body surfing sites are located along the Wai‘anae coast. Along the Wai‘anae coast, two surf shops provide equipment rentals and lessons for surfing as well as other activities such as snorkeling and kayaking (DOBOR, 2009; NOAA, 2007).
- **Diving** – There are numerous diving sites located along the Wai‘anae coast. Some of the more well-known dive sites in the area include Ka‘ena Point, Kealoa Stars (Land of Oz), Makaha Caverns, Ulua Cave, Airplane Canyon, M/V Mahi, Electric Beach, Black Rock, Black Rock Arches, 29 Down, LCU (Landing Craft Utility) Wreck, and Twin Caves. The M/V Mahi, Airplane Canyon, 29 Down, and LCU wreck were plane and boats that were intentionally sunk to serve as artificial reefs. These dive sites are frequented by the diving tour boats operating out of the WSBH and the Ko‘olina Marina (DOBOR, 2009; O‘ahu Dive Sites; Ocean Concepts O‘ahu Dive Sites).
- **Recreational Fishing** – Fishing off the Wai‘anae coast attracts people from all over O‘ahu. Numerous private and charter fishing boats provide access to near-shore and offshore fishing opportunities. One of the state’s major fishing tournaments—the Ahi Fever Fishing Tournament—is hosted by the Wai‘anae Boat Fishing Club. This annual tournament is held every June and has the largest number of registered boats and number of anglers of any tournament in Hawai‘i (NOAA, 2007).

Although far fewer inshore reef fish are caught in Wai‘anae than in other sites around the islands, goatfish or weke (*Mulloidichthys spp.*) and the introduced blue-lined snapper or ta‘ape (*Lutjanus kasmira*) are taken in fairly large numbers. Spear fishing, shore casting and throw netting are fishing methods employed by fishers along the Wai‘anae coast. Most non-commercially caught fish are kept, either for self-consumption or shared with family and friends (DOBOR, 2009).

## **Potential Impacts**

### ***Proposed Action***

The Proposed Action would result in less than significant impacts on marine recreational resources and activities. The Proposed Action Work Areas are located a considerable distance off shore, and are situated well beyond the majority of ocean recreational areas along the coast (Figure 13). Additionally, the Proposed Action is a limited effort of roughly 21 days and any interference or displacement it may cause to marine recreational or commercial activities would be temporary in nature, only lasting the duration of the Proposed Action. Further, recreational and commercial activity areas are available all along the coast and could continue to operate around Ordnance Reef (HI-06) and any delineated safety buffer zone. At the conclusion of the Proposed Action, these areas would again be available to recreational users along the Wai‘anae coast.



To further minimize impacts to marine recreational resources, the proposed location for the DSV barge will be more than a mile off shore. Furthermore, DSV operations requiring imposition of an ESQD will only operate five days per week (Monday - Friday). The ESQD will not be in place during weekday evening hours and on weekends, although the DSV may be conducting operations (e.g., processing SAA) that do not require an ESQD.

Recreational divers have been known to encounter and investigate UWMM at the Ordnance Reef (HI-06) which poses a public safety hazard. Such actions pose a potential explosive hazard to divers, particularly if divers move or disturb the UWMM encountered. Such actions may also pose a potential hazard to the public should divers remove UWMM for retention as souvenirs, for scrap value or other purposes.

As a result of the Proposed Action, some of the UWMM would be removed and no longer be an attraction to divers. Therefore, over the long-term, benefits to marine recreational resources would result from the Proposed Action as it would reduce potential health and safety hazards from the Wai‘anae coastal waters.

The Proposed Action will also provide DoD an opportunity to obtain technologies it needs to address UWMM determined to pose an unacceptable risk to the public. The Proposed Action will also meet the communities’ and state’s interest in removing some of the UWMM present at Ordnance Reef (HI-06). These are beneficial impacts, which are expected to result from the Proposed Action.

### ***No Action Alternative***

Under the No Action Alternative, the demonstration would not occur and there would be no long-term benefit. Additionally, the added safety provided by limited recovery of UWMM from depths at which most recreational divers are limited would not occur.

### ***Mitigation Measures***

No mitigation measures are warranted or proposed.

### **3.2.3. Historic and Cultural Resources**

#### **Significance Criteria**

For the purposes of the EA, historic and/or cultural resource impacts would be considered significant if a project:

- Violates federal or state agency cultural resource statutes or regulations;
- Results in the elimination or substantial permanent or long-term reduction of a traditional cultural resource area or practice without appropriate consultation and mitigation;

- Causes a substantial adverse change in the significance of a historic resource as defined on the federal level by its eligibility for listing on the National Register of Historic Places; or
- Directly or indirectly destroys a unique cultural resource or historic site.

### **Existing Conditions**

Ordnance Reef (HI-06) is offshore of the district of Wai‘anae, leeward O‘ahu. The district of Wai‘anae consists of nine ahupua‘a, including Nānākuli, Lualualei, Wai‘anae, Mākaha, Kea‘au, ‘Ōhikilolo, Mākua, Kahanahāiki, and Keawa‘ula. Wai‘anae and Lualualei are the ahupua‘a closest to Ordnance Reef (HI-06). A literature review of cultural impact assessments conducted for projects located along the Wai‘anae coast have revealed no offshore historic, cultural or archaeological resources within the offshore areas that comprise Ordnance Reef (HI-06). However, there are several other land-based or near-shore sites of significance within the ahupua‘a that comprise the Waianae district.

One particularly significant on-shore site, which has definite ties to the ocean and is relatively close to Ordnance Reef (HI-06), is the Ku‘ilioloa heiau. The heiau is situated on a small peninsula known as Kane‘ilio Point, which juts out into the sea, south of the WSBH, and separates Pōka‘ī Bay and Lualualei Beach. Said to have been built in the 11<sup>th</sup> or 12<sup>th</sup> century, the Ku‘ilioloa heiau is the only heiau in Hawai‘i that is surrounded on three sides by ocean. After the kapu system was abolished in 1819, Ku‘ilioloa was one of the few heiau still used by the Hawaiian community. Over the years, the heiau fell into disuse, but has been restored by the Wai‘anae community.

The word “Wai‘anae” has been interpreted to mean “mullet water” and has been associated with a large fresh water fishpond located within the district. This fishpond, known as Puehu, was used for mullet harvesting by native Hawaiians (Handy and Handy, 1972; Linclon and Hammatt, 2009). Historically, nearshore fisheries and marine resources have been an important resource to native Hawaiians for subsistence and recreation. The Puehu fishpond, located within Pōka‘ī Bay, off the Wai‘anae ahupua‘a, was reported to have been almost completely filled by 1954 (CSH 2009a).

The Kumulipo (creation chant) and legends of the demigod Maui make reference to Wai‘anae and the ocean, although the references are not specific to the Ordnance Reef (HI-06) area. Some legends about Maui relate to the ocean and fishing. Maui is said to have been born in Wai‘anae. The Maui Pohaku—where Maui “reposed and sunned himself”—is located along Farrington Highway in Lualualei.

Historically, Wai‘anae was known for its abundant fishing grounds, particularly for the deep sea fishing opportunities to the northwest, off Ka‘ena (CSH, 2009b). Off the coast of Wai‘anae, fish and other seafood were plentiful and early settlers were able to live off the ocean resources and thrive in this area (Sterling and Summers, 1978).

Oral accounts of community members tell of a more recent time when marine and coastal resources were still plentiful. Resources included varieties of limu (limu kohu, limu kala, limu

pe‘e pe‘e, and wāwae‘iole), fish and other marine life, shells, and coral. While many of these resources are still available in the area’s nearshore waters, the supply has been reduced. There is much less fishing and gathering done today than 50 years ago. Because of the reduced supply, most fishing and gathering practiced today is for recreational purposes and not as a means of earning a living (per. comm. G. Grace). Community members attribute this depletion to physical alterations to the coastal areas, such as breakwaters and channelized streams; the capping and diverting of upland streams; the replacement of a large sewer culvert on the Ma‘ili side of Pōka‘ī Bay; and over-harvesting of resources, beyond what is needed for subsistence (CSH, 2009b; pers. comm. A. Greenwood).

Along the Wai‘anae coast, traditional cultural practices that continue to be observed today include fishing, net laying, spear fishing/diving, gathering of limu and other marine life (e.g., pīpīpī, ‘opihi, wana), surfing, swimming, canoe paddling, diving, and honoring kupuna that have been laid to rest at sea. At one time, there was a salt pond located at Keaulana beach, where salt collection was practiced (CSH, 2009b).

Various marine plants and animals do have cultural significance to native Hawaiians. Some are mentioned in traditional oli and mele, such as the lengthy creation chant, the Kumulipo. Some plants and animals have ceremonial meaning for religious purposes. Also, many families have personal deities in animal form, known as ‘aumakua. Manō (shark), honu (turtle) and he‘e (octopus) are common marine species that are often family ‘aumakua.

## **Potential Impacts**

### ***Proposed Action***

Though it is likely that the area around Ordnance Reef (HI-06) was used historically for fishing, it is improbable that cultural or archaeological resources would be encountered at or near Demonstration Site. Surveys conducted by NOAA in support of the Proposed Action, have not, to date, encountered any evidence that would suggest sensitive historic, archaeological or cultural sites exist within Ordnance Reef (HI-06).

According to community members interviewed during this EA, the offshore Work Areas do not hold any particular cultural significance to native Hawaiians. Most activities such as fishing, diving, canoeing and gathering of limu take place closer to the shore. Interviewees also said that they did not know of the presence of any significant cultural resources in any of the offshore Work Areas, adding that the cultural legacy lives on in legends and chants. Interviewees did not believe that the Proposed Action would have any negative impact on cultural resources or practices in the Wai‘anae region (see Appendix J).

The long-term benefits of removing some of the UWMM from depths of between 30 and 120 feet as well as the knowledge gained from the Proposed Action, which could potentially be applied to the limited recovery of UWMM that may be determined to pose an unacceptable risk at other sites in Hawai‘i and around the world would offset any temporary impacts to cultural practices.

The Proposed Action is not expected to result in any significant adverse direct or indirect impacts on historic, archaeological or cultural resources, or traditional cultural practices occurring along the Wai‘anae coast. The demonstration is a limited effort of roughly 21 days and any interference or displacement it may cause to cultural practices would be temporary in nature lasting only the duration of the Proposed Action. At the conclusion of the Proposed Action, any areas used for cultural practices that may have been made temporarily inaccessible would again be available to practitioners.

The Army has determined that the Proposed Action will result in “no historic properties affected”, and in accordance with Section 106 of the NHPA of 1966, as amended, the Army has provided notification of this determination to the State Historic Preservation Officer (SHPO), and SHPO has concurred with the determination of “no historic properties affected”. The NHPA Section 106 findings and SHPO concurrence can be found in Appendix I.

### ***No Action Alternative***

Under the No Action Alternative, the demonstration would not occur and there would be no impact to historic or cultural resources.

### ***Mitigation Measures***

No mitigation measures are warranted or proposed.

## **3.2.4. Socio-Economic Conditions and Environmental Justice**

### **Significance Criteria**

For the purposes of this EA socioeconomic impacts would be considered significant if the Proposed Action:

- Creates long-term exclusion of marine areas that historically have been important to the commercial fishing and other commercial industries;
- Depletes fisheries resources;
- Creates long-term economic losses to the local commercial fishing and other industries as a result of project activities; or
- Induces substantial growth or concentration of population.

An environmental justice impact would be considered significant if project activities results in:

- A disproportionately adverse impact to a population that is more than 50 percent minority or has a minority population that is meaningfully greater than the minority population in the general population or other appropriate unit of geographic analysis; or
- A disproportionately adverse impact to a low-income population (as defined by poverty thresholds from the US Bureau of the Census).

## **Existing Conditions**

The *Wai‘anae Sustainable Communities Plan* delineates the Wai‘anae community boundary around a grouping of leeward O‘ahu ahupua‘a (i.e., traditional Native Hawaiian land division). Ahupua‘a within the defined Wai‘anae community include: Keawa‘ula, Kahanahāiki, Mākua, ‘Ōhikilolo, Kea‘au, Makaha, Wai‘anae, Lualualei, and Nānākuli (CCH, 2010). Demographic data about the Wai‘anae community was obtained from the US Census Bureau at the census tract level.

As of the 2000 Census, the Wai‘anae community had an approximate population of 42,000 persons or roughly five percent of the population of the County of Honolulu, which encompasses the entire island of O‘ahu. Table 3-3 below provides a demographic profile of the Wai‘anae community and the County of Honolulu. More recent estimates of the Wai‘anae community suggest a population of approximately 49,000 persons, which includes roughly 6,000 “homeless” persons. These “homeless” persons include those living on the beach, those in transitional shelters, and those living with friends or other family members (CCH, 2010).

**Table 3-3. Demographic Profile of the Waianae Community**

	<b><u>Wai‘anae Community</u></b>		<b><u>County of Honolulu (O‘ahu)</u></b>	
	<b>Total</b>	<b>Percentage</b>	<b>Total</b>	<b>Percentage</b>
<b><u>Basic Demographics:</u></b>				
Total Population	42,323	4.83 <sup>a</sup>	876,156	100.00
Median Household Income	\$42,098.56 <sup>b</sup>	—	\$53,310.43 <sup>b</sup>	—
Per Capita Income	\$13,435.57 <sup>b</sup>	—	\$22,067.01 <sup>b</sup>	—
Median Age	40 - 44	—	35 - 39	—
<b><u>Education:</u></b>				
Total Population (over 25) with a Bachelors Degree	1,414	6.09	109,571	18.89
<b><u>Unemployment:</u></b>				
Total Unemployed (over 16)	2,557	8.68	25,490	3.69
<b><u>Race:</u></b>				
Caucasian alone	4,701	11.10	185,413	21.16
African American alone	379	0.90	19,688	2.25
American Indian/Native Alaskan alone	143	0.34	1,881	0.21
Asian alone	7,265	17.17	404,493	46.17
Hawaiian/Pacific Islander alone	11,682	27.60	77,175	8.81
Other (1 race)	463	1.09	10,996	1.26
2 or more races	17,690	41.80	176,540	20.15

<sup>a</sup>. Percentage of Oahu’s population that resides within the Wai‘anae community area

<sup>b</sup>. In 1999 US Dollars

Source: US Census, 2000

The median age group in the Wai‘anae community is between 40 and 44 years old, slightly higher than the median age group for O‘ahu, which is 35 – 39 years old. Similar to the rest of O‘ahu, there is no ethnic or racial majority in the Wai‘anae community. Nearly 42 percent of Wai‘anae area residents identify themselves as having multiple racial heritages. However, a higher proportion of the Wai‘anae community identify themselves as being solely of Hawaiian or Pacific Islander heritage; approximately 28 percent, as compared to just nine percent for O‘ahu. Asian and Caucasian racial identities, the next two most populous identifications, comprise approximately 17 percent and 11 percent of the Wai‘anae community population, respectively (US Census, 2000). A comparison of the ethnic diversity in Wai‘anae and the County of Honolulu is shown in Figure 14.

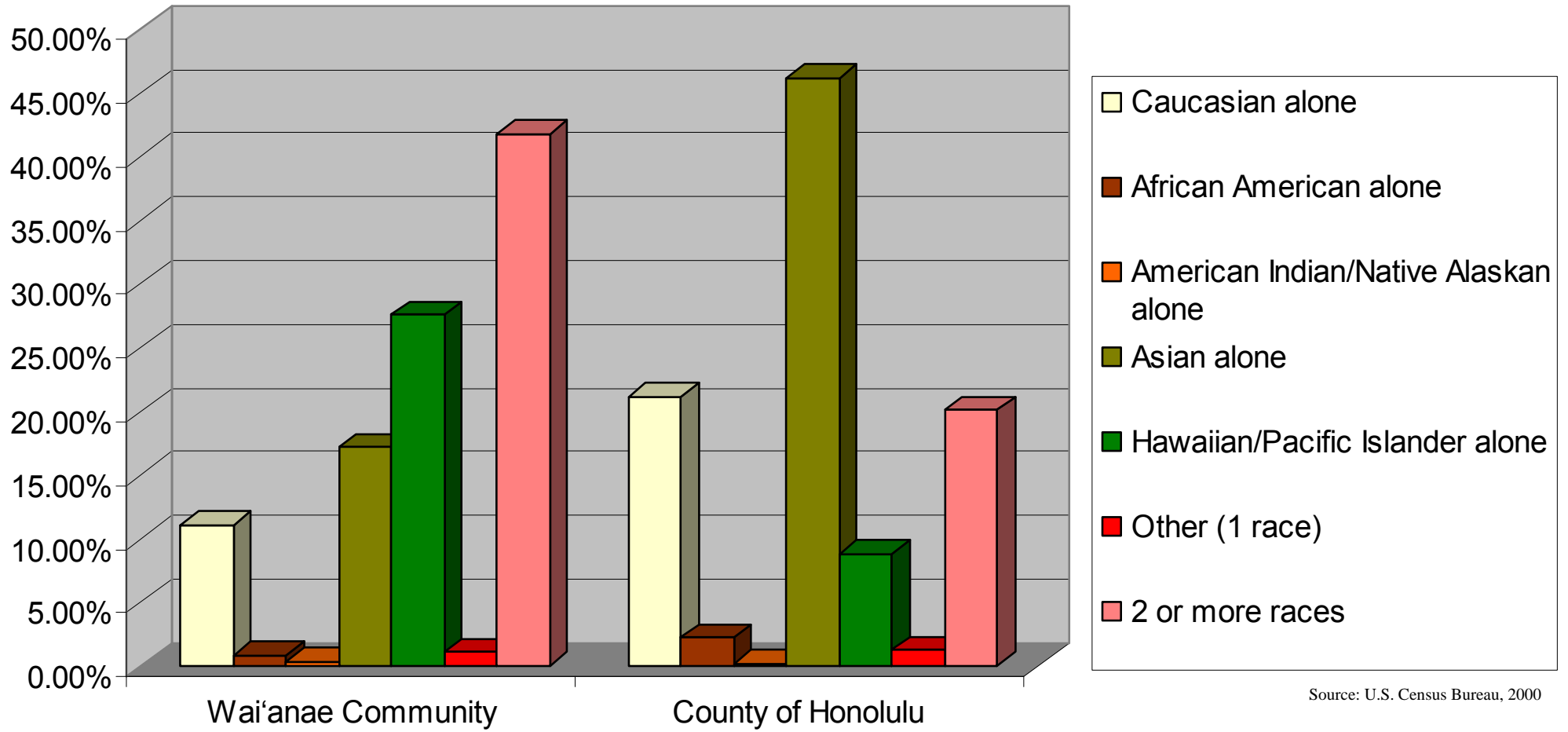
Overall, economic conditions for the Wai‘anae community are difficult to accurately quantify based on Census Bureau data. Major changes in the economic climate within the US and the state of Hawai‘i have taken place since the 2000 Census data was collected and released, and 2010 Census data will not be made available for public review until early-to-mid 2011. However, it is known that historically the Wai‘anae community has experienced lower levels of education, lower levels of income and higher rates of unemployment as compared to the rest of O‘ahu and the state of Hawai‘i. The median household and per capita income for O‘ahu was \$53,310 and \$22,067, respectively. By comparison, the Wai‘anae community had a median household income of \$42,099, and a per capita income of \$13,436. This is approximately 79 percent and 61 percent of O‘ahu’s median household and per capita income (US Census, 2000).

Unemployment in the Wai‘anae community was approximately 8.68 percent, which compares to just 3.69 percent for O‘ahu. Given the recent economic downturn, current unemployment numbers for both the Wai‘anae community and O‘ahu should be higher than that given by the 2000 Census. In regards to educational attainment, roughly six percent of the Wai‘anae community over the age of 25 had a Bachelor’s degree compare to 19 percent for O‘ahu (US Census, 2000).

### ***Commercial Activities***

There are 16 vessels that operate commercially from the WSBH. These operations include charter fishing boats, marine mammal sightseeing and snorkeling tour boats, and SCUBA diving boats. The capacities of these commercial vessels vary, and range from approximately 6 to 150 passengers (DOBOR, 2009).

The Ko‘olina Marina is a privately-owned facility located near the southern tip of the leeward O‘ahu shoreline. The Ko‘olina Marina has 330 slips, 23 of which are reserved for commercial operations. There were 13 commercial vessels operating out of the Ko‘olina Marina, which consisted of charter fishing boats and sailboats, marine mammal sightseeing and snorkeling tour boats, and SCUBA diving tour boats (DOBOR, 2009). In addition, vessels operating out of other harbors and marinas around O‘ahu may also conduct commercial activities along the Waianae coast.



Source: U.S. Census Bureau, 2000

**Comparison of Ethnic Diversity in Wai'anae vs. the County of Honolulu**

**FIGURE 14**

Skipjack tuna or aku (*Katsuwonus pelamis*) is the top commercially-caught species landed in the Wai‘anae district. Other species caught in large numbers along the Wai‘anae coast include yellowfin (*Thunnus albacares*), bigeye ahi (*Thunnus obesus*), and blue marlin (*Makaira mazara*) (NOAA, 2007). Near-shore species that are commercially fished along the Wai‘anae coast include akule (*Selar crumenophthalmus*) and ‘ōpelu (*Decapterus macarellus*) (DLNR-DOBOR, 2009). Bottomfish fishing is not a significant commercial fishing activity along the Wai‘anae coast. The “Deep 7” species (opakapaka, onaga, lehi, ehu, hapu, gindai and kalekale) only constitute roughly 0.3 percent of the total commercially-landed bottomfish in Hawaiian waters (DAR, 2008).

According to the *Commercial Marine Landings Summary Trend Report for Calendar Year 2008*, sea landings (i.e., fish caught) off the Wai‘anae coast totaled 667,466 pound, or 11 percent of the total landings in the Main Hawaiian Islands (DAR, 2008).

## **Potential Impacts**

### ***Proposed Action***

The Proposed Action is not expected to result in any significant adverse impacts to the existing socio-economic conditions of the Wai‘anae community or to Environmental Justice. Proposed Action activities would be conducted within roughly a 21-day window during the summer of 2011. Because of its limited scope, the Proposed Action would have no long-term direct measurable effects, positive or negative, on the employment or population of the Wai‘anae community. Furthermore, the Proposed Action would not result in disproportionate adverse impacts to minority or low-income populations within the Wai‘anae community either in the long- or short-term.

The Proposed Action would result in some beneficial impacts on the local area, particularly marine operators. To support the Proposed Action, several commercial small boat operators will be needed to maintain the safety zone around the DSV, and local UXO-qualified personnel will be involved in some operations, including the processing of scrap metal. The limited recovery of UWMM from depths between approximately 30 and 120 feet from Ordnance Reef (HI-06) may also provide some benefit to commercial marine operators by reducing the potential explosives hazards present.

The limited recovery of UWMM would also result in potential beneficial impacts as UWMM are often encountered and investigated by recreational divers, and the limited removal of munitions from depths of between approximately 30 and 120 feet would reduce the potential human health and safety risks associated with divers moving, disturbing or attempting to recover UWMM as souvenirs, for scrap value or for other purposes.

Potential impacts resulting from the Proposed Action, which do not meet the significance criteria, or can be effectively mitigated, would not result in significant adverse impacts to socio-economic conditions and environmental justice.



### *No Action Alternative*

Under the No Action Alternative, the Proposed Action would not occur and there would be no impact to socio-economic resources or Environmental Justice.

### *Mitigation Measures*

No mitigation measures are warranted or proposed.

### **3.3. Cumulative Impacts**

Cumulative impacts are two or more individual effects, that, when considered together, compound or increase the overall impact. Cumulative impacts can arise from the individual effects of a single action or from the combined effects of past, present, or future actions. Thus, cumulative impacts can result from individually minor but collectively significant actions taken over a period of time. The cumulative impacts of implementing the Proposed Action along with past and reasonably foreseeable future projects proposed were assessed based upon available information.

Considering the off-shore location of Ordnance Reef (HI-06), cumulative impacts associated with the Proposed Action would be primarily associated with other in-water or maritime improvement projects along the Wai‘anae coast. No known future improvement projects are expected to occur within the immediate area of Ordnance Reef (HI-06). However, the proposed Hoakalei development in ‘Ewa Beach, which is approximately 15 miles south of Ordnance Reef (HI-06), will include the construction of a new 52-acre marina, containing approximately 600 to 800 boat slips. Although excavation for the new Hoakalei Marina is approximately 70 percent complete, the marina is not expected to be completed for several more years (DOBOR, 2009).

Due to the off-shore location and the roughly 21-day schedule of the Proposed Action, the absence of other existing or future projects in the area, and the timing and location of known maritime improvement projects, cumulative impacts are not anticipated.

#### 4. Summary of Environmental Consequences

The Proposed Action was assessed with regard to potential direct, indirect, and cumulative impacts on the environment. The previous sections of this EA have provided a discussion of potential impacts and how they pertain to the Proposed Action and different environmental attributes. Table 4-1 below provides a summary of the environmental impacts associated with the Proposed Action.

**Table 4-1. Summary of Impacts for the Proposed Action**

<b>Environmental Attribute</b>	<b>Direct Impacts</b>	<b>Indirect Impacts</b>	<b>Cumulative Impacts</b>
Water Quality and Sediments	N	N	N
Benthic Habitat and Coral Reefs	M, (-)	M, (-),(+)	N
Reef Fish	L, (-)	L, (-),(+)	N
Protected Species	L, (-)	L, (-),(+)	N
Air Quality	L, (-)	N	N
Noise Environment	L, (-)	L, (-)	N
Public Health and Safety	N	L, (+)	N
Marine Recreational Resources	L, (-)	L, (+)	N
Historic and Cultural Resources	N	L,(+)	N
Socio-Economics and Environmental Justice	L,(+)	L,(+)	N

N = No impact

L = Less than significant impact

M = Significant Impact, but mitigable to less than significant

S = Significant impact

(+) = Beneficial impact

(-) = Adverse impact

As shown in the table above, environmental impacts resulting from the Proposed Action are not anticipated to be significant and are limited to negligible direct operational impacts that are temporary and short-term in nature. As discussed in the previous sections, where appropriate, mitigation measures will be employed to eliminate and/or further diminish any such impacts. No significant indirect or cumulative impacts were identified as a result of the Proposed Action.

Under the No Action Alternative, none of the UWMM present at the Demonstration Site at depths between approximately 30 and 120 feet would be recovered from the marine environment. Environmental quality in the area would remain unchanged or could potentially be adversely impacted by the continued corrosion and degradation of the UWMM and release of MC over time. In addition, potential human health and safety risks associated with divers moving, disturbing, or attempting to recover UWMM as souvenirs, for scrap value, or for other purposes would remain.

## **5. Relationship To Environmental Regulations and Policies**

### **5.1. Coastal Zone Management Act (CZMA)**

The CZMA of 1972, as amended (16 USC 1451 et seq.), is administered in Hawaiʻi by the Department of Business Economic Development and Tourism's (DBEDT) Office of Planning. The CZMA affects all projects on federal lands and/or involving federal agencies and requires federal agencies to conduct their planning, management, development and regulatory activities in a manner consistent with the state's coastal zone management (CZM) program. The CZM program objectives and policies are to provide coastal recreational opportunities; preserve and protect historic, scenic and coastal ecosystem resources; provide economic uses; reduce coastal hazards; improve public awareness in coastal zone management; and manage development within the coastal zone. The entire island of Oʻahu is situated within the coastal zone area affected by the CZMA and a consistency determination of "no effect" is required for the Proposed Action under the CZM program.

The Proposed Action is located within the "state coastal zone" under the CZMA. The Army has reviewed Hawaii's CZM program and associated enforceable policies, and determined that the Proposed Action would have no significant adverse impacts on any coastal use or resource. Furthermore, the Proposed Action's beneficial impacts would be consistent with state CZM program policies and objectives, by improving the quality of state coastal waters and the marine environment (i.e., returning the area to more natural conditions). The Army is submitting a letter to the State Office of Planning which provides specific information related to the Proposed Action and certifies that the Proposed Action complies to the maximum extent practicable with the enforceable policies of the State of Hawaii's federally-approved coastal management program (Attached as Appendix E).

### **5.2. The Endangered Species Act (ESA)**

The ESA of 1973 requires that every federal agency ensure that any action it carries out is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse impact of habitat critical to that species. The USFWS has jurisdiction over endangered and threatened terrestrial flora, fauna, and birds. NOAA, through the NMFS, has jurisdiction over marine mammals and fish. The two agencies share responsibility for listed (threatened or endangered) sea turtles.

Under Section 7 of the ESA, the responsible federal agency must consult with these agencies when a Proposed Action (i.e., the Demonstration) may impact listed or candidate species under their jurisdiction. The Army has determined that by applying applicable BMPs throughout the roughly 21-day Proposed Action, there will most likely not be adverse impacts to either the marine environment or ESA-listed species, including green and hawksbill turtles, the Hawaiian monk seal, and humpback whales that may transit Ordnance Reef (HI-06). By letter dated December 1, 2010, the Army initiated informal consultation with NMFS seeking concurrence with this determination, and received concurrence from NMFS by letter dated January 19, 2011, with the added stipulation that the BMPs be amended to expand the protection

zone for these protected species from 50 yards to 63 meters to guard them from acoustic impacts from operation of the ROUMRS vehicle. Copies of these correspondences are included at Appendix F of this EA. In addition, the Army and NOAA continue to work closely to identify and avoid, minimize and mitigate potential impacts to coral in the vicinity of Ordnance Reef (HI-06) through the CAMIP as discussed in substantial detail in Section 3.1.2.2. – Coral Reefs – Mitigation Measures – above.

### **5.3. Fish and Wildlife Coordination Act (FWCA)**

By letter dated December 1, 2010, the Army requested consultation under the Fish and Wildlife Coordination Act (16 USC 661 et seq.; 48 Stat. 401), as amended (FWCA) and requested a Planning Aid Letter to address protection of wildlife during execution of the proposed technology demonstration. A copy of this letter and related correspondence is included at Appendix G of this EA. Agency review under the FWCA helps determine the possible damage to fish and wildlife resources by a proposed activity, and develop means and measures designed to prevent the loss or damage to fish and wildlife resources. As a result of consultation, the USFWS has made the recommendation that the CAMIP (attached as Appendix C) be followed to avoid/minimize loss or damage to corals, fish, and wildlife resources.

### **5.4. Marine Mammal Protection Act (MMPA)**

The MMPA of 1972 (16 USC 1361, et seq.) was the first article of legislation to call specifically for an ecosystem approach to natural resource management and conservation. MMPA prohibits the taking of marine mammals, and enacts a moratorium on the import, export, and sale of any marine mammal, along with any marine mammal part or product within the US. The US Congress defines “take” as “the act of hunting, killing, capture, and/or harassment of any marine mammal; or, the attempt at such.” The MMPA provides for enforcement of its prohibitions, and for the issuance of regulations to implement its legislative goals. When it initiated consultation under Section 7 of the ESA, the Army also requested consultation with NMFS on potential impacts to marine mammals under the MMPA. The Army is seeking a Letter of Concurrence from NMFS that the Proposed Action will not adversely impact or result in a take of a marine mammal protected under the MMPA.

### **5.5. Magnuson-Stevens Fishery Conservation and Management Act**

The Magnuson-Stevens Fishery Conservation and Management Act (Public Law 94-265) (16 USC 1801-1882, April 13, 1976, as amended) requires that federal agencies consult with NMFS on activities that could harm Essential Fish Habitat (EFH) areas.

The Act specifies that the NMFS must coordinate with other federal agencies to conserve and enhance EFH, and federal agencies must consult with NMFS on all actions or proposed projects authorized, funded, or undertaken by the agency that may adversely affect EFH. In turn, NMFS must provide recommendations to federal and state agencies on such activities to conserve EFH. These recommendations may include measures to avoid, minimize, mitigate, or

otherwise offset adverse effects on EFH resulting from actions or proposed projects authorized, funded, or undertaken by that agency.

Under the Act, the Army has initiated consultation with NMFS requesting concurrence with its finding that implementation of the Proposed Action will not adversely affect designated EFH for federally-managed fisheries in the Pacific Ocean (see initiation letter in Appendix H). During the consultation process, NMFS has concurred that provided project BMPs are implemented fully and properly, NMFS does not object to the determination of no adverse effect on EFH.

## **5.6. The National Historic Preservation Act (NHPA)**

Section 106 of the NHPA of 1966, as amended, and its implementing regulations (36 CFR Part 800), requires federal agencies while reviewing and evaluating their programs to identify and consider the potential effects of their Proposed Actions on historical, archaeological, and architectural resources in consultation with the Advisory Council on Historic Preservation (ACHP), the SHPO, and other interested members of the public. The ACHP encourages consultation among the agency official/proponent of the action, SHPO, and other interested parties during the early stages of the planning process.

The Proposed Action's area of potential effect is in water approximately 30 to 120 feet deep. There is no evidence of historic or cultural properties in the vicinity of Ordnance Reef (HI-06). The Proposed Action is not expected to affect any historic or cultural properties. The Army initiated Section 106 consultation with the Hawai'i State Historic Preservation Division and other potentially interested parties and organizations by letters dated December 2, 2010. The Army received concurrence from SHPO by letter dated December 19, 2010 on its determination that there will be no effect on historic or cultural properties resulting from the Proposed Action (Appendix I).

## **5.7. The Rivers and Harbors Act (RHA)**

Under the RHA of 1899, USACE has been delegated the responsibility of preserving navigation through the Department of Army (DA) permit program. Work that affects the course, condition, location, or capacity of navigable waters is prohibited by Section 10 of the RHA, unless a permit is obtained from the USACE. The Proposed Action is subject to the provisions of the Act, and a Section 10 RHA Permit is required prior to commencing proposed activities. A copy of the RHA permit application is included as Appendix K.

## **5.8. Federal Clean Water Act (CWA)**

The federal CWA prohibits the discharge of dredged or fill material into waters of the US without authorization from the USACE under the DA permit program. Because the Proposed Action will not involve the discharge of dredged or fill material, a CWA authorization under Section 404 is not required.

## **5.9. Federal Clean Air Act (CAA)**

The federal CAA (42 USC 7401) requires the adoption of national AAQS to protect public health, safety, and welfare from known or anticipated effects of air pollution. As discussed in Section 3.1.3, the State of Hawaii DOH Clean Air Branch determined that the Proposed Action would not result in adverse impacts to air quality and/or violate the CAA and has issued an Air Permit Exemption (Appendix D).

## **5.10. Resource Conservation and Recovery Act (RCRA)**

RCRA (42 USC 6901-6992k) was enacted by Congress in 1976. The primary policy of RCRA is that generated waste should be treated, stored, or disposed of so as to minimize the present and future threat to human health and the environment.. RCRA requires the States to regulate the management of solid waste and authorizes EPA and approved States to regulate the management and disposal of hazardous waste. RCRA provides “cradle-to-grave” control of hazardous waste by imposing waste management requirements on generators and transporters of hazardous waste and on owners and operators of treatment, storage, and disposal facilities. The State of Hawaii DOH has been authorized by EPA to regulate hazardous waste management in lieu of the Federal RCRA program. Hawaii DOH does so pursuant to State law and regulations

Under the Proposed Action, the handling of UWMM is management of solid (and potentially hazardous due to ignitability) waste. Subsequent treatment of recovered military munitions that are hazardous waste during the EHDS process constitutes the treatment of a hazardous waste. The further management and disposal of the residual materials, including recycling of the casings and munitions debris, is management of solid waste.

The Army has initiated coordination with the state of Hawaiʻi Department of Health – Solid and Hazardous Waste Branch (SHWB) to ensure that the Proposed Action will be in full compliance with applicable Federal and State RCRA requirements. In accordance with applicable sections of HAR 11-270 and EPA regulation 40 CFR 270, the Army has applied for a Hazardous Waste Research, Development, and Demonstration Treatment Permit for the Proposed Action. Correspondence with the SHWB and the Hazardous Waste Permit Application are attached as Appendix L.

## **5.11. Executive Order (EO) 13089 – Protection of Coral Reefs**

EO 13089 states that “all Federal agencies whose actions may affect US coral reef ecosystems shall: (a) identify their actions that may affect US coral reef ecosystems; (b) use their programs and authorities to protect and enhance the conditions of such ecosystems; and (c) to the extent permitted by law, ensure that any actions they authorize, fund or carry out will not degrade the conditions of such ecosystems.”

As noted in Section 5.2 above, the Army has initiated consultation with the USFWS and NMFS. The continued consultation with these agencies, and additional recommendations set forth in the CAMIP, will ensure that the Proposed Action will comply with EO 13089 regarding the protection of coral reefs.

#### **5.12. EO 12898 – Environmental Justice in Minority Populations and Low-Income Populations and EO 13045 – Protection of Children from Environmental Health Risks and Safety Risks**

On February 11, 1994, EO 12898 entitled *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* was issued. EO 12898 requires federal agencies to identify and address disproportionately high and adverse human health and environmental effects of federal programs, policies, and activities on minority and low-income populations.

A Presidential memorandum that accompanied EO 12898 specified that federal agencies “shall analyze the environmental effects, including human health, economic and social effects, of Federal actions, including effects on minority communities, when such analysis is required by the National Environmental Policy Act of 1969, 42 U.S. Code Section 4321 et seq.” The memorandum further stated that federal agencies “shall provide opportunities for community input in the NEPA process, including identifying potential effects and mitigation measures in consultation with affected communities and improving the accessibility of meetings, crucial documents, and notices.”

On April 20, 1997, EO 13045 entitled *Protection of Children from Environmental Health Risks and Safety Risks* was issued. EO 13045 requires that federal agencies make it a priority to identify and assess environmental health and safety risks that may disproportionately affect children. It also requires that agencies ensure that their policies, programs, activities, and standards address such risks.

No significant adverse environmental impacts are anticipated as a result of the Proposed Action. The Proposed Action involves technology demonstration activities, over a limited off-shore area, over a roughly 21-day period. Any impact from the Proposed Action would be negligible, short-term and temporary in nature. As discussed in Section 3.2.4, there would be no significant adverse environmental impacts to minority and low-income populations within the Waiʻanae community. No disproportionate adverse effects on children are expected to result from implementation of the Proposed Action. The Proposed Action would result in beneficial impacts to public health and safety and the environment.

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This EA was prepared for ODASA(ESOH) by the US Army Engineer District, Honolulu, Engineering and Construction Division, Environmental Branch and its subcontractor Wil Chee – Planning and Environmental. The following list identifies individuals and organizations involved in the preparation of this EA and their respective roles

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## **8. Appendices**

- Appendix A – Munitions Discovered at Ordnance Reef (2002 and 2006)
- Appendix B – Best Management Practices Plan
- Appendix C – NOAA - Coral Avoidance and Minimization of Injury Plan (CAMIP)
- Appendix D – Department of Health Air Permit Exemption
- Appendix E – CZMA Consistency Determination
- Appendix F – ESA and MMPA Consultation
- Appendix G – Fish and Wildlife Coordination Act Consultation
- Appendix H – Magnuson-Stevens Fishery Conservation and Management Act - EFH Consultation
- Appendix I – NHPA Section 106 Consultation
- Appendix J – Traditional Cultural Practices and Resources Assessment
- Appendix K – Rivers and Harbors Act Permit Application
- Appendix L – Hazardous Waste Treatment Permit Application