Naval Facilities Engineering Systems Command

EXWC Engineering & Expeditionary Warfare Center

TECHNICAL REPORT

TR-NAVFAC EXWC-SH-25011

ESTABLISHING USE CONTROLS AT UNDERWATER MUNITIONS RESPONSE SITES

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14. ABSTRACT

Remedial Project Managers (RPMs) for the Department of the Navy (DON) Environmental Restoration Program (ERP) need guidance on how to establish underwater use controls for exposure control in the water at munitions response sites (MRSs). The objective of this document is to provide advisement for RPMs on best practices to implement underwater use controls since the Navy does not own the water or seabed.

15. SUBJECT TERMS

Underwater; Munitions Response; Land Use Controls

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ACRONYMS AND ABBREVIATIONS

3Rs	Recognize, Retreat, Report
AMNWR	Alaska Maritime National Wildlife Refuge
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulation
COTP	Captain of the Port
DEC	Alaska Department of Environmental Conservation
DLNR	State of Hawaii Department of Land and Natural Resources
DoD	U.S. Department of Defense
DOI	Department of Interior
EPA	U.S. Environmental Protection Agency
IC	Institutional Control
LUC	land use controls
MARCORSYSCOM	Marine Corps Systems Command
MassDEP	Massachusetts Department of Environmental Protection
MCBQ	Marine Corps Base Quantico
MEC	Munitions and Explosives of Concern
MPPEH	munitions potentially presenting an explosive hazard
MRS	munitions response site
NASD	Naval Ammunition Support Detachment
NAVFAC	Naval Facilities Engineering Systems Command
NCDEQ	North Carolina Department of Environmental Quality
NOAA	National Oceanic and Atmospheric Administration
NTCRA	non-time-critical removal action
NWP	Nationwide Permit
PCN	pre-construction notification
PRDNER	Puerto Rico Department of Natural and Environmental Resources
RAB	Restoration Advisory Board
ROD	Record of Decision
RPM	Remedial Project Manager
U.S.C.	United States Code
USACE	U.S. Army Corps of Engineers
USCG	U.S. Coast Guard
USFWS	U.S. Fish and Wildlife Service
UXO	unexploded ordnance

VAC	Virginia Administrative Code
VMRC	Virginia Marine Resources Commission
VNTR	Vieques Naval Training Range
WOTUS	Waters of the United States
WQC	Water Quality Certificate

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1.0 INTRODUCTION

The purpose of this technical report is to provide Department of the Navy (Navy) Remedial Project Managers (RPMs) with an initial resource to assist in managing underwater munitions response sites (MRSs). It provides historical information regarding the presence of munitions in United States waters, examples of controls that have been implemented at certain underwater MRSs, and reviews the unique legal, regulatory, policy, and related factors that may affect and/or influence controls at underwater MRSs.

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2.0 HISTORICAL PERSPECTIVE OF UNDERWATER MUNITIONS RESPONSE SITES

There are more than 400 underwater MRSs in the United States, comprising more than 10 million acres (**Figure 2-1**). Most of these sites are in coastal areas such as nearshore open ocean, harbors, marshes, and estuaries, but inland areas such as ponds, lakes, and rivers also make up a portion of the underwater munitions site inventory.

Sources of underwater munitions include historical coastal defense training, sea disposal, and munitions loading, unloading, dumping, or accidents in and around wharfs, piers, harbors, berthing areas, and shipyards. Bombing, aerial gunnery, and testing associated with water- and land-based ranges are other sources of underwater munitions, as are ordnance-laden ships wrecked or sunk in coastal waters. While acts of war are also sources of underwater munitions, those sites are excluded from cleanup authority such as the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

Since the inception of the U.S. Department of Defense (DoD) Military Munitions Response Program more than 20 years ago, land use controls (LUCs) have been commonly associated with cleanup and management at MRSs. Because land[1] use is an integral component of cleanup under authorities such as CERCLA, so too are the controls that are implemented to ensure reasonably anticipated site use(s) and associated exposures are consistent with remaining hazards (in this case, munitions and/or munitions constituents), whether on land or under water. The legal aspects of LUCs and their associated principles and policies that can be found in existing law and guidance form the basis for use controls at underwater MRSs, but there are unique elements associated with underwater MRSs relative to terrestrial sites that require additional consideration.

While extensive experience, guidance, and other resources are available to assist with planning, implementing, and monitoring terrestrial-based LUCs, the same is not true of underwater MRSs. Nevertheless, there are underwater MRSs in the DoD inventory where controls have been implemented to restrict access and/or provide awareness to users of the underwater areas. Although not a comprehensive list, **Table 2-1** provides examples of underwater MRSs, historical and current use of the sites, the types of controls planned or in place, the mechanism(s) associated with their implementation, and links to resources that provide additional details regarding the controls.

[1] In the context of use controls, “land” includes both terrestrial and water sites.

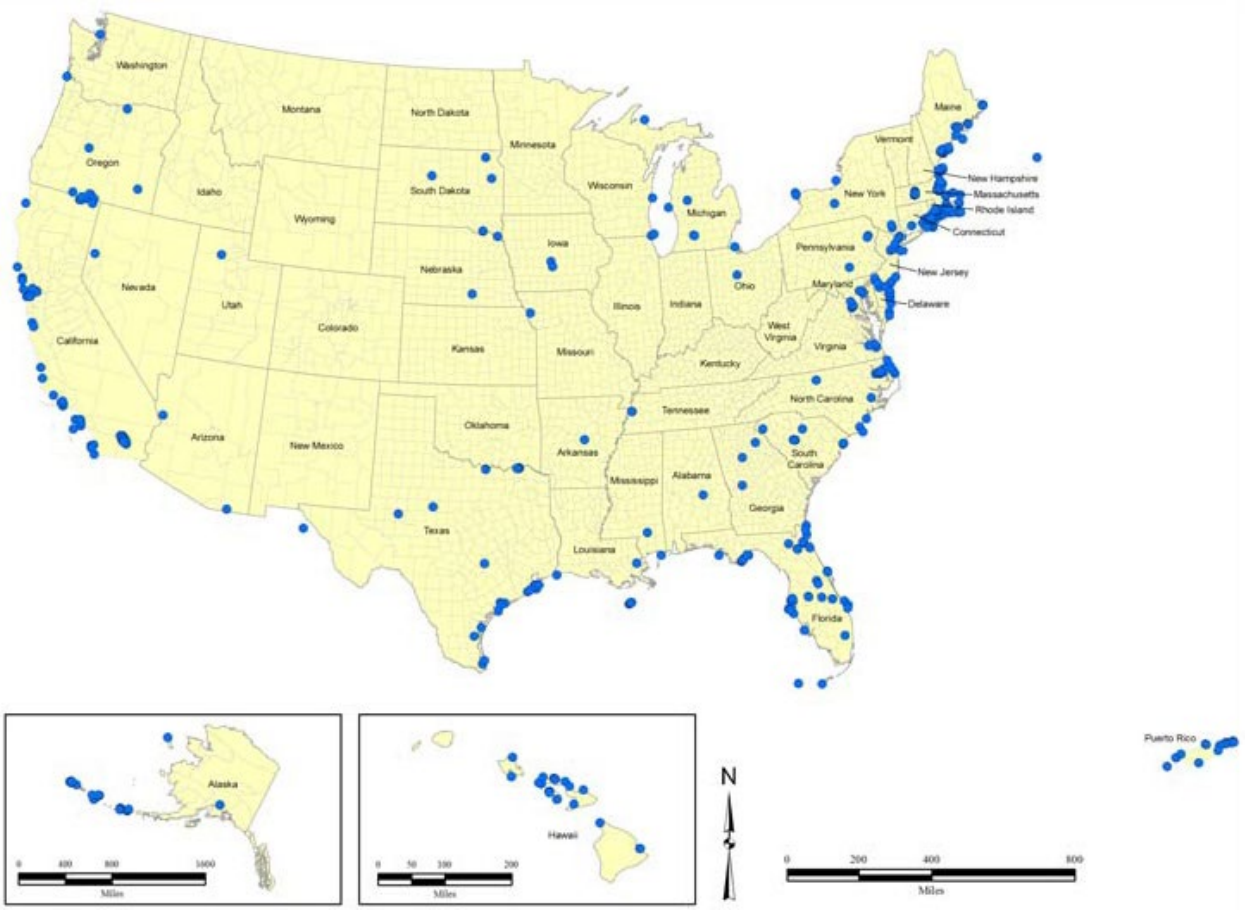
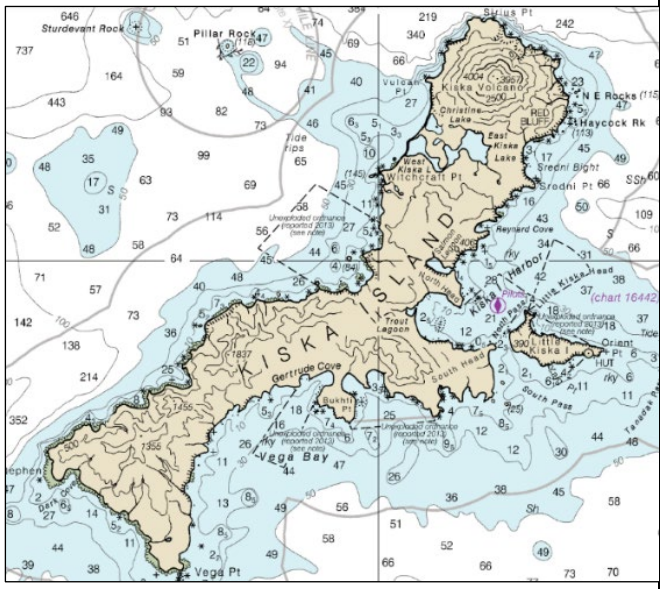


Figure 2-1. Ranges and Training Areas within Tidal and Inland Water Areas

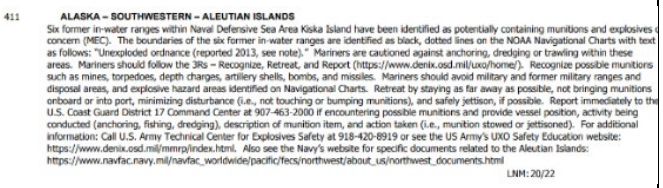
Source: SERDP/ESTCP 2010

Table 2-1. Underwater Munitions Response Sites with Use Controls

Alaska	
Naval Defensive Sea Area Kiska Island	
Underwater Area Type	Open ocean
Underwater Area Description	Territorial waters between shoreline and 3-mile radius around Kiska Island and Little Kiska Island, including locations of historical piers, in-water ranges, and bombing targets.
Historic Site Use	Act of war and defense training during World War II (coastal defense - anti-aircraft gun batteries, supply transfer points, U.S. Air Force and Navy air combat training).
Current Site Use	Part of AMNWR. While there is no permanent human presence on the island, permitted recreational activities on the island and fishing/diving in the waters surrounding the island do occur.
Stakeholder Agencies	Navy, DEC, AMNWR, USFWS
Underwater Controls	Institutional controls and land use restrictions • Publishing a USCG Local Notice to Mariners and completing edits to Coast Pilot • Updating NOAA navigational charts for Kiska Island (including the Electronic Chart Display Information Systems with MEC information) • Producing a brochure for land management and other agencies to provide with permits/information requests • Providing MEC awareness information (including 3Rs explosive safety information) for posting in public facilities in the Aleutian Islands focusing on areas where visitors to Kiska may pass through (e.g., airports, ports, town halls, post offices) • Providing MEC awareness information to commercial (e.g., fishing) and noncommercial organizations (e.g., charters transporting research or recreational users) who are likely to visit Kiska Island
Implementing Mechanism(s) and Resources(s)	• Implementing Mechanism – Action Memorandum (2020) • Resource – NAVFAC Northwest, 2020



(NOAA 2015a) (**Attachment 1**, Photograph 1)



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Six former in-water ranges within Naval Defensive Sea Area Kiska Island have been identified as potentially containing munitions and explosives of concern (MEC). The boundaries of the six former in-water ranges are identified as black, dotted lines on the NOAA Navigational Charts with text as follows: "Unexploded ordnance (reported 2013, see note)." Mariners are cautioned against anchoring, dredging or trawling within these areas. Mariners should follow the 3Rs – Recognize, Retreat, and Report (https://www.denix.osd.mil/uxo/home/). Recognize possible munitions such as mines, torpedoes, depth charges, artillery shells, bombs, and missiles. Mariners should avoid military and former military ranges and disposal areas, and explosive hazard areas identified on Navigational Charts. Retreat by staying as far away as possible, not bringing munitions onboard or into port, minimizing disturbance (i.e., not touching or bumping munitions), and safely jettison, if possible. Report immediately to the U.S. Coast Guard District 17 Command Center at 907-463-2000 if encountering possible munitions and provide vessel position, activity being conducted (anchoring, fishing, dredging), description of munition item, and action taken (i.e., munition stowed or jettisoned). For additional information: Call U.S. Army Technical Center for Explosives Safety at 918-420-8919 or see the US Army's UXO Safety Education website: https://www.denix.osd.mil/mmrp/index.html. Also see the Navy's website for specific documents related to the Aleutian Islands: https://www.navfac.navy.mil/navfac_worldwide/pacific/fecs/northwest/about_us/northwest_documents.html

LNM: 20/22

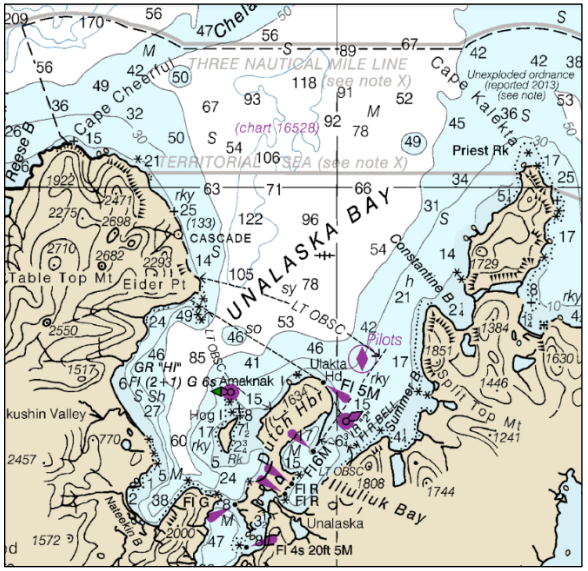
(USCG 2023a) (**Attachment 1**, Photograph 2)

Table 2-1. Underwater Munitions Response Sites with Use Controls

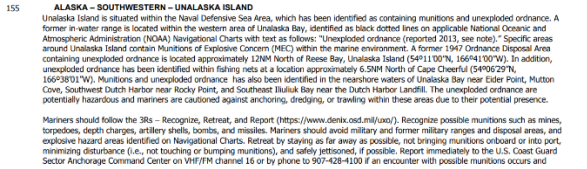
Naval Defensive Sea Area Kodiak Island		
Underwater Area Type	Open ocean	(797.001) **Caution** (797.002) Cape Ugat was used as a bombing target during World War II. There is the potential for the presence of spent and/or unexploded ordnance remnants in the area. Cape Ugat and the immediate vicinity surrounding it should be treated as a potential munitions and unexploded ordnance hazard area. The unexploded ordnance are potentially hazardous and mariners are advised against anchoring, dredging, or trawling [within this area due] to their potential presence. (19.001) **Caution** (19.002) Latax Rocks were used as a bombing target during World War II. There is the potential for the presence of spent and/or unexploded ordnance remnants in the area. Latax Rocks and the immediate vicinity surrounding it should be treated as a potential munitions and unexploded ordnance hazard area. The unexploded ordnance are potentially hazardous and mariners are advised against anchoring, dredging, or trawling within these areas due to their potential presence. (890.001) **Caution** (890.002) Outer Seal Rock was used as a bombing target during World War II. There is the potential for the presence of spent and/or unexploded ordnance remnants in the area. Outer Seal Rock and the immediate vicinity surrounding it should be treated as a potential munitions and unexploded ordnance hazard area. The unexploded ordnance are potentially hazardous and mariners are advised against anchoring, dredging, or trawling in this area due to their potential presence. (NOAA 2024) (**Attachment 1**, Photographs 3 through 5)
Underwater Area Description	Territorial waters between shoreline and 3-mile radius around Kodiak Island and associated islands, including locations of historical piers, in-water ranges, and bombing targets.	
Historic Site Use	Act of war and defense training during World War II (coastal defense - anti-aircraft gun batteries, supply transfer points, U.S. Air Force and Navy air combat training).	
Current Site Use	Kodiak Island is the main part of the larger Kodiak Island Borough. Land ownership within the borough is divided between federal, native corporation or Tribal villages, state, public, and local city borough. USFWS is the single largest landowner in the borough. The wildlife refuges are maintained primarily for the management and protection of Kodiak brown bears and other wildlife on land and sea, but also allow a wide variety of recreational and commercial uses. The USCG manages Base Kodiak on Kodiak Island. The base complex supports various USCG activities and contains a full range of urban facilities, including recreational, residential, institutional, and commercial land uses.	
Stakeholder Agencies	Navy, DEC, USFWS	
Underwater Controls	Institutional controls and land use restrictions implemented as a NTCRA • Publishing a USCG Local Notice to Mariners and completing edits to Coast Pilot • Updating NOAA navigational charts for Kodiak Island and associated islands (including the Electronic Chart Display Information Systems with MEC information) • Producing a brochure for land management and other agencies to provide with permits/information requests • Providing MEC awareness information (including 3Rs explosive safety information) for posting in public facilities in the Aleutian Islands focusing on areas where visitors to Kodiak Island may pass through (e.g., airports, ports, town halls, post offices) • Providing MEC awareness information to commercial (e.g., fishing) and noncommercial organizations (e.g., charters transporting research or recreational users) who are likely to visit Kodiak Island	
Implementing Mechanism(s) and Resources(s)	• Implementing Mechanism – Action Memorandum (2023) • Resource – NAVFAC Northwest (2023)	

Table 2-1. Underwater Munitions Response Sites with Use Controls

Naval Defensive Sea Area Unalaska Island	
Underwater Area Type	Open ocean
Underwater Area Description	Territorial waters between shoreline and 3-mile radius around Unalaska Island and associated islands, including locations of historical piers, in-water ranges, and bombing targets.
Historic Site Use	Act of war and defense training during World War II (coastal defense - anti-aircraft gun batteries, supply transfer points, U.S. Air Force and Navy air combat training).
Current Site Use	Unalaska is the population and economic center for the Aleutian Islands area, which is the largest fishing port in the United States in terms of volume of seafood caught and second largest in monetary value. Marine resources in Unalaska are used in recreation and are sources of food for all members of the community of Unalaska. Activities include recreational sport fishing and other activities regulated by the Alaska Department of Fish and Game, recreational wildlife viewing, bicycling, hiking, boating, and fishing.
Stakeholder Agencies	Navy, DEC, USFWS
Underwater Controls	Institutional controls and land use restrictions implemented as an interim NTCRA • Publishing a USCG Local Notice to Mariners and completing edits to Coast Pilot • Updating NOAA navigational charts for Unalaska Island and associated island (including the Electronic Chart Display Information Systems with MEC information) • Producing a brochure for land management and other agencies to provide with permits/information requests • Providing MEC awareness information (including 3Rs explosive safety information) for posting in public facilities in the Aleutian Islands focusing on areas where visitors to Unalaska Island may pass through (e.g., airports, ports, town halls, post offices) • Providing MEC awareness information to commercial (e.g., fishing) and noncommercial organizations (e.g., charters transporting research or recreational users) who are likely to visit Unalaska Island
Implementing Mechanism(s) and Resources(s)	• Implementing Mechanism – Action Memorandum (2023) • Resource – NAVFAC Northwest (2023)



(NOAA 2015b) (**Attachment 1**, Photograph 6)



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ALASKA – SOUTHWESTERN – UNALASKA ISLAND

Unalaska Island is situated within the Naval Defensive Sea Area, which has been identified as containing munitions and unexploded ordnance. A former in-water range is located within the western area of Unalaska Bay, identified as black dotted lines on applicable National Oceanic and Atmospheric Administration (NOAA) Navigational Charts with text as follows: "Unexploded ordnance (reported 2013, see note)." Specific areas around Unalaska Island contain Munitions of Explosive Concern (MEC) within the marine environment. A former 1947 Ordnance Disposal Area containing unexploded ordnance is located approximately 12NM North of Reese Bay, Unalaska Island (54º11'00"N, 166º41'00"W). In addition, unexploded ordnance has been identified within fishing nets at a location approximately 6.5NM North of Cape Cheerful (54º06'29"N, 166º38'01"W). Munitions and unexploded ordnance has also been identified in the nearshore waters of Unalaska Bay near Elder Point, Mutton Cove, Southwest Dutch Harbor near Rocky Point, and Southeast Iliuliuk Bay near the Dutch Harbor Landfill. The unexploded ordnance are potentially hazardous and mariners are cautioned against anchoring, dredging, or trawling within these areas due to their potential presence.

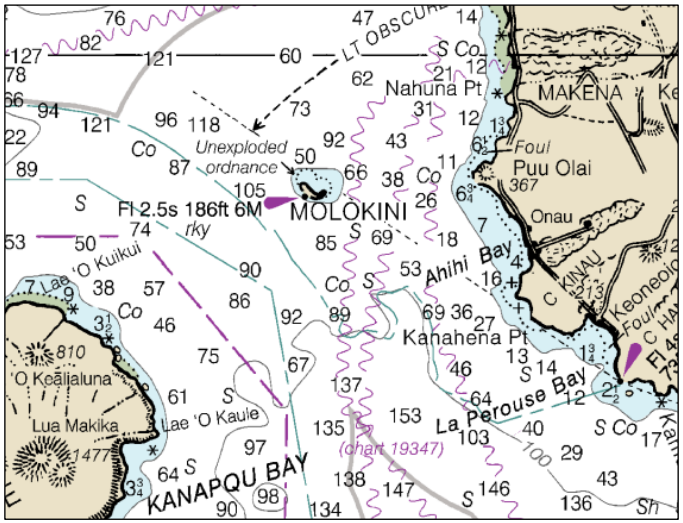
Mariners should follow the 3Rs – Recognize, Retreat, and Report (https://www.denix.osd.mil/uxo/). Recognize possible munitions such as mines, torpedoes, depth charges, artillery shells, bombs, and missiles. Mariners should avoid military and former military ranges and disposal areas, and explosive hazard areas identified on Navigational Charts. Retreat by staying as far away as possible, not bringing munitions onboard or into port, minimizing disturbance (i.e., not touching or bumping munitions), and safely jettisoned, if possible. Report immediately to the U.S. Coast Guard Sector Anchorage Command Center on VHF/FM channel 16 or by phone to 907-428-4100 if an encounter with possible munitions occurs and

(USCG 2023b) (**Attachment 1**, Photograph 7)

Table 2-1. Underwater Munitions Response Sites with Use Controls

Hawaii	
Molokini Crater Islet	
Underwater Area Type	Open ocean
Underwater Area Description	Submerged portion of ancient volcanic crater
Historic Site Use	The above-water portion of the crater was used for bombing practice during World War II because its size and shape simulated an enemy warship.
Current Site Use	As the central feature of the Molokini Shoal Marine Life Conservation District, the area is used for marine recreational activities, primarily scuba diving and snorkeling via commercial operators, with fishing allowed in some areas.
Stakeholder Agencies	DLNR
Underwater Controls	Public outreach, including: • Distributing "3Rs" explosives safety pamphlets and flyers to divers/snorkelers and boaters • Updating NOAA navigational charts to notify mariners of the hazards in the area
Implementing Mechanism(s) and Resources(s)	• Implementing Mechanism – DLNR notifications • Resource – DLNR (2020)

(MauiNow 2020) (**Attachment 1**, Photograph 8)

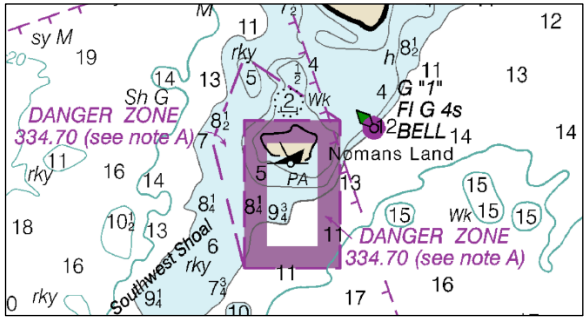


(NOAA 2008) (**Attachment 1**, Photograph 9)

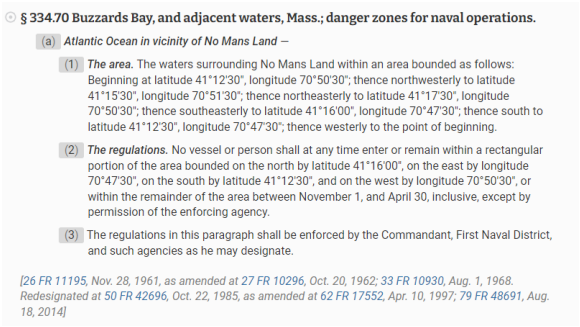
Table 2-1. Underwater Munitions Response Sites with Use Controls

Massachusetts	
Nomans Land Island	
Underwater Area Type	Open ocean
Underwater Area Description	Nearshore marine environment surrounding 628-acre Nomans Land Island National Wildlife Refuge that is part of the Eastern Massachusetts National Wildlife Refuge Complex.
Historic Site Use	The island was used by the Navy for air-to-surface bombing and gunnery target exercises from 1943 through 1996. In 1998, it was transferred to DOI to be managed by the USFWS.
Current Site Use	There is no authorized public use of the island or waters surrounding the island. Around the time the Navy began bombing operations, the island and surrounding waters were designated a Danger Area, so designated on nautical maps, and remains as such to the present day. 33 CFR 334.70 codified permanent restrictions on access to waters immediately surrounding the island and seasonal restrictions further offshore.
Stakeholder Agencies	Navy, USFWS, MassDEP
Underwater Controls	Institutional controls, public awareness, and enforcement for both Nomans Land Island and the nearshore marine environment: • Institutional controls: – Restricted Waterway designation that prohibits unauthorized vessels from entering the area – Upland signage – Beach signage – Annual verification – UXO response program should MEC be found • Public awareness: – UXO awareness training for USFWS/public – UXO awareness pamphlet • Enforcement: – USCG/Massachusetts Environmental Police Coastal Bureau
Implementing Mechanism(s) and Resources(s)	• Implementing Mechanisms – ROD (2022) – 33 CFR 334.70 (Restricted Waterway designation) • Resources – NAVFAC (2022) – https://www.ecfr.gov/current/title-33/chapter-II/part-334/section-334.70

(USFWS, 2010) (**Attachment 1**, Photograph 10)



(NOAA 2012) (**Attachment 1**, Photograph 11)



§ 334.70 Buzzards Bay, and adjacent waters, Mass.; danger zones for naval operations.

(a) *Atlantic Ocean in vicinity of No Mans Land* –

(1) ***The area.*** The waters surrounding No Mans Land within an area bounded as follows: Beginning at latitude 41°12'30", longitude 70°50'30"; thence northwesterly to latitude 41°15'30", longitude 70°51'30"; thence northeasterly to latitude 41°17'30", longitude 70°50'30"; thence southeasterly to latitude 41°16'00", longitude 70°47'30"; thence south to latitude 41°12'30", longitude 70°47'30"; thence westerly to the point of beginning.

(2) ***The regulations.*** No vessel or person shall at any time enter or remain within a rectangular portion of the area bounded on the north by latitude 41°16'00", on the east by longitude 70°47'30", on the south by latitude 41°12'30", and on the west by longitude 70°50'30", or within the remainder of the area between November 1, and April 30, inclusive, except by permission of the enforcing agency.

(3) The regulations in this paragraph shall be enforced by the Commandant, First Naval District, and such agencies as he may designate.

[26 FR 11195, Nov. 28, 1961, as amended at 27 FR 10296, Oct. 20, 1962; 33 FR 10930, Aug. 1, 1968. Redesignated at 50 FR 42696, Oct. 22, 1985, as amended at 62 FR 17552, Apr. 10, 1997; 79 FR 48691, Aug. 18, 2014]

(33 CFR 334.70) (**Attachment 1**, Photograph 12)

Table 2-1. Underwater Munitions Response Sites with Use Controls

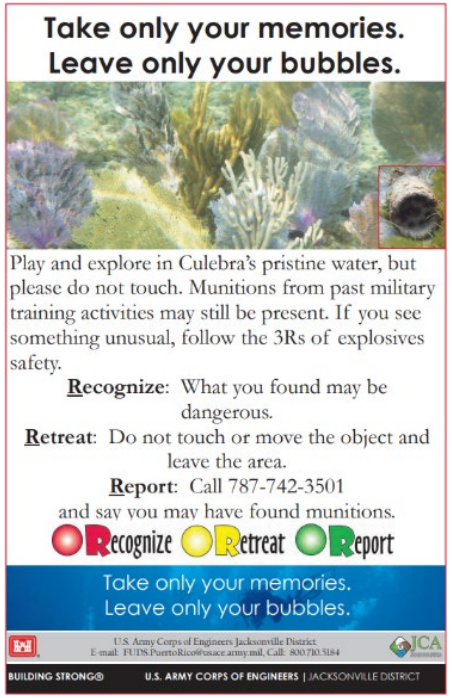
North Carolina		
Cat Island Bomb Target 2 (BT-2)		
Underwater Area Type	Lagoon	 (U.S. Marine Corps 2017) (**Attachment 1**, Photograph 13).
Underwater Area Description	The water portion of the surface danger zone associated with historical bombing targets on and adjacent to Wood Island, which is within Bogue Sound. Bogue is separated from the Atlantic Ocean by a 21-mile-long barrier island.	
Historic Site Use	Between 1943 and 1955, Wood Island and nearby targets used for practice with air-delivered inert and live ordnance, including general purpose bombs, armor-piercing bombs, depth bombs, rockets, and machine gun ammunition.	
Current Site Use	Based on historic use and potential explosive hazards, Navy retains ownership of Wood Island. Bogue Sound is used for primarily recreational purposes such as boating, fishing, and crabbing. Wood Island remains undeveloped and is used as a Colonial Waterbird Nesting Area. Warning signs have been placed around the island and MEC removals are ongoing.	
Stakeholder Agencies	Navy, NCDEQ	
Underwater Controls	In addition to surface MEC removal and warning signs on Wood Island, the following are the controls for the surrounding waters of Bogue Sound: • Maintaining 20 signs installed in 2012 in the shallow water surrounding Wood Island that warn boaters of the danger of anchoring or other bottom-disturbing activities • Ensuring the nautical chart warning indicators for the area around Wood Island are maintained on the NOAA nautical charts	
Implementing Mechanism(s) and Resources(s)	• Implementing Mechanism – Decision Document (NAVFAC 2015) • Resources – NAVFAC (2015) – https://administrative-records.navfac.navy.mil/Public_Documents/MID_ATLANTIC/CHERRY_POINT_MCAS/M00146_005955.pdf	

Table 2-1. Underwater Munitions Response Sites with Use Controls

Puerto Rico	
Culebra Island	
Underwater Area Type	Open ocean, bays
Underwater Area Description	Flamenco Bay and Luis Pena Channel are two former water ranges, but there are smaller water areas included in various terrestrial-based sites.
Historic Site Use	The Island of Culebra, nearby cays, and surrounding water were used by the Navy and Marine Corps between 1902 and 1975 for training with bombs, rockets, missiles, mortars, projectiles, mines, and small arms.
Current Site Use	The majority of water areas of the former training areas, including Flamenco Bay and Luis Pena Channel, are not restricted from public use and are used for recreational purposes. All water areas are still in the investigation and/or remedial alternatives evaluation phases.
Stakeholder Agencies	USACE, PRDNER, Municipality of Culebra
Underwater Controls	Public outreach, including: • Notifying the public when underwater investigations are occurring and requesting the public cooperate by remaining outside of the exclusion zones • 3Rs messaging and awareness materials for recreational users of water areas
Implementing Mechanism(s) and Resources(s)	• Implementing Mechanism – Website, public outreach materials • Resources – USACE. n.d.a. Formerly Used Defense Sites (FUDS): Culebra, Puerto Rico. https://www.saj.usace.army.mil/Culebra/. – USACE. n.d.b. *Take only your memories. Leave only your bubbles*. https://usace.contentdm.oclc.org/digital/collection/p16021coll7/id/6324

Photos from Publicly Distributed Information Products.

(USACE 2005) (**Attachment 1**, Photograph 14)



(USACE 2018) (**Attachment 1**, Photograph 15)

Table 2-1. Underwater Munitions Response Sites with Use Controls

Atlantic Fleet Weapons Training Area - Vieques		
Underwater Area Type	Open ocean	 Source: Photos from Jacobs Inspections. (**Attachment 1**, Photograph 16)
Underwater Area Description	The underwater areas adjacent to portions of the former VNTR and former NASD, which were used by the U.S. and its allies for military training from the mid-1940s through 2003.	
Historic Site Use	The former VNTR was used for ground warfare and amphibious training, naval gunfire support training, and air-to-ground training. During this training, more than 300,000 munitions were fired onto the land and into the surrounding water. In 2003, the former VNTR was transferred to DOI to be managed by USFWS as part of the Vieques National Wildlife Refuge. In 2001, the only munitions site on the former NASD was transferred to DOI to be managed by USFWS as part of the Vieques National Wildlife Refuge.	
Current Site Use	Since 2003, the Navy has been performing investigations and munitions cleanup on both the land and in the surrounding water. The eastern portion of the former VNTR corresponds to where most live-fire training occurred. Therefore, there is a heightened potential for UXO to be present both on land and in the water in this area. As a result, offshore controls have been implemented there to enhance public safety while munitions cleanup is taking place. Recreational activities (e.g., boating, swimming, scuba diving, snorkeling, fishing) occur in the waters adjacent to the former VNTR and former NASD, including within prohibited areas of the former VNTR.	
Stakeholder Agencies	Navy, USCG, EPA Region 2, PRDNER, USFWS	
Underwater Controls	Maritime safety zone • Mariner warning buoys • Maritime Safety Zone established by law and enforced by USCG – Mariners are prohibited from anchoring, dredging, or trawling within the safety zone due to the presence of underwater UXO – Mariners are prohibited from entering the safety zone during land-based and offshore UXO clearance operations – Mariner warning buoys delimiting the safety zone UXO 16.1 (offshore area adjacent to western end of the former NASD).	In addition to removal of nearshore MEC, the following are the controls for the site: • Educational kiosk • Signs • Notice to mariners 3R messaging for all offshore areas associated with the former VNTR and former NASD • RAB meetings • Social medial postings • Informational brochures, flyers, and newsletters • Educational kiosks posted within the Vieques National Wildlife Refuge

Table 2-1. Underwater Munitions Response Sites with Use Controls

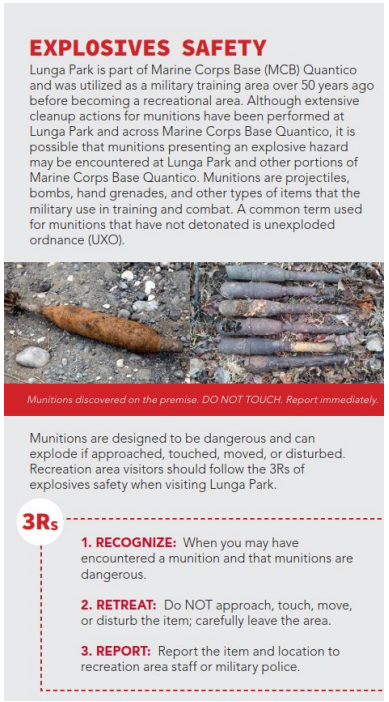
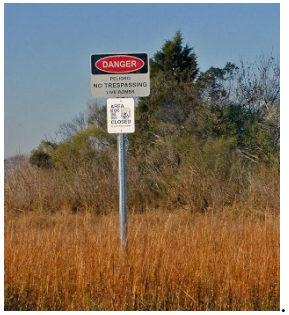
Implementing Mechanism(s) and Resources(s)	• Implementing Mechanisms – 33 CFR 165.787 (Maritime Safety Zone) – Final UXO 16.1 ROD (NAVFAC 2023) – Public outreach	• Resources – https://www.federalregister.gov/documents/2020/10/19/2020-22973/safety-zones-vieques-unexploded-ordnance-operations-east-vieques-vieques-puerto-rico – https://administrative-records.navfac.navy.mil/Public_Documents/ATLANTIC/VIEQUES/N3172B_003338.pdf – 86 FR 61; NAVFAC (n.d.) – https://www.navfac.navy.mil/Business-Lines/Environmental/Products-and-Services/Environmental-Restoration/Atlantic/Vieques/
Virginia		
Lunga Reservoir, Marine Corps Base Quantico (MCBQ)		
Underwater Area Type	Lake	
Underwater Area Description	Approximately 520-acre reservoir within the Guadalcanal Section of MCBQ.	
Historic Site Use	A World War II-era artillery and mortar range existed prior to reservoir creation.	
Current Site Use	Approximately 320 acres are within a defined recreational area and 200 acres are within active training areas. Reservoir closed to recreational use in 2012 due to munitions investigations and removals. The reservoir was reopened for recreational use in 2023.	
Stakeholder Agencies	Navy, MCBQ, MARCORSYSCOM	
Underwater Controls	Institutional and engineering controls implemented via an Interim Land Use Control Plan: • Water access (e.g., boating) to recreational area of reservoir allowed with following restrictions: – Access only via approved access points – No bottom or sub-bottom contact – No access to area of reservoir within active training areas while training is occurring • Boating notification signs, including notice to check in/check out with onsite outfitter • Danger Zone buoys and flags to identify restricted areas of the reservoir • Informational brochures and website postings	 (Boster 2022) (**Attachment 1**, Photograph 17)  (MCCS 2023) (**Attachment 1**, Photograph 18)

Table 2-1. Underwater Munitions Response Sites with Use Controls

Implementing Mechanism(s) and Resources(s)	• Implementing Mechanism
	  – Base Order
	• Resource
	  – https://www.quantico.marines.mil/Portals/147/Adjutant/SSIC/05000/MCINCR-MCBQO%205090.1%20MCINCR-MCBQ%20LUNGA%20RECREATION%20AREA%20OPERATIONS.pdf?ver=tOsiP5hFWIU4hzK2n7_5nQ%3d%3d	

Plum Tree Island Range		
Underwater Area Type	Salt marsh	 Plum Tree Island National Wildlife Refuge is closed to the public due to UXO throughout the refuge. In the public domain. (USFWS 2004) (**Attachment 1**, Photograph 19)
Underwater Area Description	Approximately 3,000 acres of salt marsh on the Chesapeake Bay between the Poquoson and Back Rivers. The former range is part of the larger Plum Tree Island National Wildlife Refuge. The waterways are under the jurisdiction of the Commonwealth of Virginia.	
Historic Site Use	Training range for air-to-ground bombing, gunnery, and rocket practice from 1917 through late 1950s.	
Current Site Use	Transferred to DOI in 1972 to be managed by USFWS as a national wildlife refuge. No continuous public access to the wildlife refuge is allowed, but there are certain activities that are authorized, including seasonal hunting, fishing, crabbing, and clamming.	 (USACE 2009) (**Attachment 1**, Photograph 20)
Stakeholder Agencies	USACE, USFWS, VMRC	

Underwater Controls	In addition to removal of exposed MEC from "high exposure" areas, the following are the controls for all water areas:
	• A Restricted Area established under Commonwealth of Virginia law and enforced by the VMRC
	• Use restrictions comprising prohibitions on:
	  – Anchoring
	  – Clamming with rakes, shovels, or hoes
	  – Dredging, including prop dredging
	  – Beaching or grounding of vessels
	  – Walking on the bottom
	• Allowed activities/uses comprising:
	  – Setting and hauling crab pots, gill nets, and drag nets
	  – Installing and maintaining warning signs
	• Implementing a 3R Explosives Safety Education Program comprising:
	  – Munitions awareness and education to the public and specifically to authorized users
	  – Informational displays and print media, including fact sheets, in public areas
	  – Public meetings
	  – Periodic press releases
	• Construction support by UXO-qualified personnel for any construction within the Restricted Area	

Table 2-1. Underwater Munitions Response Sites with Use Controls

Implementing Mechanism(s) and Resources(s)	• Implementing Mechanisms – Decision Document (2019) – VMRC Plum Tree Island Wildlife Refuge Range Regulation (2005)	• Resource – USACE (2019) – VMRC (2005) (4VAC20-1065-10 et seq)

3R = Recognize, Retreat, Report

AMNWR = Alaska Maritime National Wildlife Refuge

CFR = Code of Federal Regulations

DEC = Alaska Department of Environmental Conservation

DLNR = State of Hawaii Department of Land and Natural Resources

DOI = Department of Interior

EPA = U.S. Environmental Protection Agency

MARCORSYSCOM = Marine Corps Systems Command

MassDEP = Massachusetts Department of Environmental Protection

MCBQ = Marine Corps Base Quantico

MEC = Munitions and Explosives of Concern

NASD = Naval Ammunition Support Detachment

NCDEQ = North Carolina Department of Environmental Quality

NOAA = National Oceanic and Atmospheric Administration

NTCRA = non-time-critical removal action

PRDNER = Puerto Rico Department of Natural and Environmental Resources

RAB = Restoration Advisory Board

ROD = Record of Decision

USACE = U.S. Army Corps of Engineers

USCG = U.S. Coast Guard

USFWS = U.S. Fish and Wildlife Service

UXO = unexploded ordnance

VAC = Virginia Administrative Code

VMRC = Virginia Marine Resources Commission

VNTR = Vieques Naval Training Range

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3.0 ESTABLISHING ACCESS AND USE CONTROLS FOR UNDERWATER MUNITIONS RESPONSE SITES

As indicated in Section 2, although significant guidance and other resources exist regarding primarily terrestrial-based LUCs, implementing LUCs at underwater MRSs requires consideration of factors not generally associated with terrestrial MRSs.

This section addresses the most common circumstances associated with implementing LUCs at underwater MRSs. It lays out an approach for teams to follow when LUCs are needed and how to go about establishing them. The first steps are determining the type of water and the types of LUCs that are needed.

This discussion addresses Waters of the United States (WOTUS) which by definition are within the interior of the United States and within 12 nautical miles of the coastline. International waters are not addressed in this technical report. WOTUS are divided into the following two categories:

- **Navigable Waters:** WOTUS that are also (1) subject to the ebb and flow of the tide and/or (2) are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. (33 CFR 329.4)
- **Non-navigable Waters:** WOTUS that do not meet the definition of a navigable water. (Note: The regulatory status of these waters is in flux at the time of writing. Consult with legal counsel regarding how to determine if non-navigable waters are WOTUS at specific sites.)

LUCs may be implemented during various phases of work at MRSs. They may be short- or long-term (such as part of removal action vs. remedial action) and are separated into institutional controls and engineering controls as follows:

- **Institutional Controls (ICs):** "… nonengineered instruments…that help to minimize the potential for human exposure to contamination and/or protect the integrity of a response action…. There are generally four categories of [ICs]: governmental controls; proprietary controls; enforcement and permit tools with IC components; and information devices." (EPA 2012).
- **Engineering Controls**: physical measures designed to minimize the potential for human exposure to contamination by limiting direct contact or controlling the migration of contaminants in environmental media.

Within the context of this technical report, the most common controls at underwater MRSs are use restrictions, buoys, and signage, and various barriers. The laws and regulations that apply to establishing these LUCs differ based on whether the control is an administrative instrument or physically placed within WOTUS. Therefore, the information presented herein is divided into sections for establishing use controls and placing signs/barriers/buoys within navigable and non-navigable WOTUS. A discussion of federal requirements is included along with the state and local requirements that can be reasonably discussed.

The following considerations should be evaluated, because it is not practical to provide comprehensive guidance for every circumstance:

- A combination of measures may be needed that include administrative and physical controls. There may be circumstances where these can be implemented independently or where they must be implemented consecutively in a required order.
- Stakeholders for these specific processes are included herein. However, additional stakeholders, such as those identified in the partnering process, may also play a role.
- Both the substantive and administrative requirements associated with LUC implementation are included herein. It is assumed that if an exemption to administrative requirements applies (for

example, under CERCLA), that exemption is known and will be factored into the LUC implementation process.

- All WOTUS are included in the discussion. All WOTUS that are within a state or territory are also waters of the State; however, the reverse is not always true. Waters of the State that are not also WOTUS (e.g., certain isolated wetlands and roadside ditches) are not addressed in this technical report.
- There is substantial variability in state and local water and property control laws, which is outside the practical considerations in this technical report. A brief overview of potential considerations is included where feasible, and consultation with legal counsel is recommended.

3.1 Establishing Use Restrictions in Navigable and Non-navigable Waters

Use restrictions in navigable waters are typically enacted through formal rulemaking. In non-navigable waters, the approach is less well-defined. The following subsections discuss the approaches in more detail.

Use restrictions may include access or use limitations to specific locations as well as buffer zones around moving vessels. Use and access restrictions would typically apply around locations where munitions potentially presenting an explosive hazard (MPPEH) and MEC may still be present within the WOTUS. Access limitations may consist of limiting all unauthorized entry, limiting entry by certain vessels (for example, draft limitations), and restricting certain activities (such as swimming or anchoring). Restrictions around moving vessels may be needed during clearance activities and when vessels are moving recovered MPPEH or MEC to another location for further management.

Also of note, response activities are often conducted by DoD contractors that may be working in close proximity to active military ports and vessels. The regulatory use restrictions discussed in these subsections would also apply to these vessels during operation.

3.1.1 Use Restrictions in Navigable Waters

USACE and USCG are the two primary stakeholders when establishing and enforcing use restrictions in navigable waters. For MRSs, USACE will usually establish enforceable use restrictions, while USCG will be involved with navigation aids. USCG will establish the enforceable use restrictions when that authority has been specifically delegated to the USCG. This may occur in areas where there is controlled vessel traffic such as ports. The RPM should coordinate with both USACE and USCG to determine the appropriate lead for establishing the use restriction. For any of these areas, the agency that sets the restriction (USACE or USCG) enforces it in coordination with other law enforcement agencies, as needed.

Use restrictions enacted by USACE define affected areas as either Danger Zones or Restricted Areas, as follows:

- **Danger Zone:** A defined water area (or areas) used for target practice, bombing, rocket firing, or other especially hazardous operations, normally for the armed forces. The Danger Zones may be closed to the public on a full-time or intermittent basis [33 CFR 334.2(a)].
- **Restricted Area:** A defined water area for the purpose of prohibiting or limiting public access to the area. Restricted Areas generally provide security for Government property and/or protection to the public from the risks of damage or injury arising from the Government's use of that area [33 CFR 334.2(b)].

The list of established Danger Zones and Restricted Areas at the time of writing can be found in 33 CFR 334.10-1490. Subsequently identified areas would be included as additional sections to 33 CFR 334.

Restrictions enacted by USCG define affected areas as Regulated Navigation Areas, Safety Zones, or Security Zones (with Safety Zones and Security Zones collectively called Limited Access Areas), as follows:

- **Regulated Navigation Area:** A water area within a defined boundary for which regulations for vessels navigating within the area have been established. These regulations could control times of vessel entry, movement, or departure; establish limitations on vessel size, speed, draft, and operating conditions; and restrict vessel operation to only those which have particular operating characteristics or capabilities (33 CFR 165, Subpart B).
- **Safety Zone:** A water area, shore area, or water and shore area to which, for safety or environmental purposes, access is limited to authorized persons, vehicles, or vessels. Access to these areas is completely prohibited without authorization from the Captain of the Port (COTP) or the District Commander in that jurisdiction (33 CFR 165, Subpart C).
- **Security Zone:** Area of land, water, or land and water that is designated for such time as is necessary to prevent damage or injury to any vessel or waterfront facility, to safeguard ports, harbors, territories, or waters of the United States or to secure the observance of the rights and obligations of the United States (33 CFR 165, Subpart D).

USCG has established a specific Regulated Navigation Area around U.S. naval vessels called the Naval Vessel Protection Zone (33 CFR 165, Subpart G). This zone is a 500-yard area around any U.S. naval vessel more than 100 feet in length where the operations of other vessels is limited or prohibited. The list of other USCG Regulated Navigation Areas and Limited Access Areas can be found in 33 CFR 165, Subpart F.

Of note, if a restriction is needed for an unforeseen, emergency situation, USCG can establish the area through a verbal request where the cause is explained and USCG concurs.

In addition to USACE and USCG, other potential stakeholders that should be consulted for a use restriction on navigable waters may include state environmental/natural resources agencies, federal and state fish and wildlife protection agencies, state coastal zone management agencies, and the State Historic Preservation Office. Consultations with these agencies may be formal or informal and also may be conducted either by the Navy or by USACE/USCG during the rulemaking process. Property owners may also be stakeholders; however, this is less common. Consultation with potentially applicable stakeholder agencies to determine jurisdiction is advised.

The following describes potential additional stakeholders whose involvement may affect the LUCs implemented:

- **State Environmental and Natural Resources Agencies:** Many states claim ownership of the land beneath waters of the State (both navigable and non-navigable) as well as specific control of buffer areas surrounding them. These agencies could have requirements that also must be addressed in establishing use restrictions.
- **Federal and State Fish and Wildlife Protection Agencies:** May be stakeholders if the munitions response site is within navigable or non-navigable waters that are protected wildlife areas or will be in the future. The specific content of the use restrictions, the affected areas, and the basis for establishing the LUC(s) could be affected.
- **State Coastal Zone Management Agencies:** Depending on their specific charter, these state agencies may play a role in establishing or enforcing use restrictions.
- **State Historic Preservation Office:** May be stakeholders if the munitions response site is within navigable or non-navigable waters that are areas with historical or cultural significance, or the use restriction could affect such areas. The specific content of the use restrictions could be affected.

- **Tribal Governments:** If activities will affect Tribal lands, it will be necessary to coordinate with Tribal governments to understand additional requirements and potential issues with establishing controls.
- **Property Owners:** Private landowners do not typically own navigable waters themselves; however, they and public landowners (e.g. city or county) may own adjacent lands. If the use restrictions would impact their property or use of the shoreline (e.g. access, recreation, waterfront projects) then they could be stakeholders.
- **Businesses:** Businesses in fishing, ship repair, shipping, tourism, and/or offshore development can be affected by restricting access to key areas and delaying projects. Safety concerns may reduce fishing zones and deter tourism activities like diving and water sports and incur additional liabilities.

The listed agencies would typically act to enforce their own regulations. In the case of private property owners, enforcement mechanisms would depend on the specific law in question.

3.1.1.1 Requesting Danger Zones and Restricted Areas from USACE

USACE establishes Danger Zones and Restricted Areas under the authority of Title 33 of the United States Code (U.S.C.) Sections 1 and 3. These laws require the Department of the Army to prescribe regulations for the use of navigable waters to prevent injuries related to the use of munitions. This includes areas that may be endangered by artillery fire, proving ground operations, and areas that may be occupied by submarine mines, mine fields, submarine cables, or other material and accessories pertaining to seacoast fortifications (33 U.S.C. 1 and 3). The rules promulgated under these laws are found at 33 CFR 334.

The requirements for requests to establish, amend, or revoke a Danger Zone or Restricted Area are located in 33 CFR 334.4. Requests must contain sufficient information for the USACE District Engineer to issue a public notice. The minimum information required for such a request is the contact information for the requestor, name of waterway, name of closest city, zone location with a map, and a brief statement of need, description of times, dates, and extent of Danger Zone or Restricted Area.

In evaluating any request to establish a Danger Zone or Restricted Area, USACE will follow their regulatory policies for issuing permits while providing for public access to the maximum extent practical and will not unreasonably interfere with the food fishing industry.

The public notice will be published in the Federal Register and also routed to the following agencies as indicated in **Table 3-1**.

Table 3-1. Danger Zone and Restricted Area Additional Agency Notification

Agency	Notification required if:
Federal Aviation Administration	Air space is affected
Commander, Service Force, U.S. Atlantic Fleet	Off the Atlantic Coast
Commander, Naval Base, Seattle	On the coast of Alaska, Oregon, and Washington
Commander, Naval Base, San Diego	On the coast of California
Commander, Naval Base, Pearl Harbor	On the coast of Hawaii and Trust Territories

The District Engineer may conduct a public hearing in accordance with 33 CFR 327. After the public comment period is closed and after District Engineer review of all comments received, the request will be forwarded to the Office of the Chief of Engineers. The request will include a recommendation for whether the request should be approved or not approved and include environmental documentation prepared in accordance with the National Environmental Policy Act requirements in 33 CFR 325, Appendix B.

A final decision will be made by the Office of the Chief of Engineers and will be published in the Federal Register. The final rule will become effective no sooner than 30 days after publication in the Federal Register. Once established, the areas are enforced by USACE in cooperation with other law enforcement agencies as needed and appropriate.

3.1.1.2 Requesting Regulated Navigation Areas, Safety Zones, and Security Zones from USCG

USCG establishes Regulated Navigation Areas, Safety Zones, and Security Zones under the authority of The Ports and Waterways Safety Act (46 U.S.C. 700). This authority applies, "…in any port or place under the jurisdiction of the United States, in the navigable waters of the United States, or in any area covered by an international agreement…," and allows USCG to control most aspects of vessel traffic, including completely restricting operation, in areas that are considered hazardous. The regulations implementing this can be found in 33 CFR 165.

Regulated Navigation Areas, Safety Zones, and Security Zones are defined in 33 CFR 165, Subparts B, C, and D, respectively. Of the three, Safety Zones are the most applicable to munitions response. These are defined in 33 CFR 165.20 as, "…a water area, shore area, or water and shore area to which, for safety or environmental purposes, access is limited to authorized persons, vehicles, or vessels. It may be stationary and described by fixed limits or it may be described as a zone around a vessel in motion." Regulations in 33 CFR 165.23 generally prohibit persons, vehicles, vessels, or objects from entering Safety Zones.

The USCG establishment procedures, found in 33 CFR 165.5, are not as complex as those that must be followed by USACE. A written request must be submitted to either the COTP or the Coast Guard District Commander who has jurisdiction over the area. If a request is being made to establish a use restriction less than 5 days in advance of when the restriction is needed, an oral request may be made with a written follow up in 24 hours. The request should include the person requesting, the location, boundaries, start date and time, a description of activities, nature of the desired restrictions, and the reason.

3.1.2 Use Restrictions in Non-navigable Waters

In many cases, use restrictions for MRSs in non-navigable waters are governed in a similar way to terrestrial MRSs and use the same mechanisms (for example, deed restriction or environmental covenant). In addition, onsite actions taken under the authority of CERCLA are generally exempt from local laws unless their power is derived from a federal or state law or regulation. However, should the need arise to restrict access to privately owned property, it is possible that this exemption may not be complete. Consultation with legal counsel is recommended in locations where land is privately held. The following stakeholders should be considered during the process of establishing use restrictions:

- **State Environmental and Natural Resources Agencies:** Many states claim ownership of the land beneath waters of the State (both navigable and non-navigable), as well as specific control of buffer areas surrounding them. These agencies could have requirements that also must be addressed in establishing use restrictions.
- **Federal and State Fish and Wildlife Protection Agencies:** May be stakeholders if the munitions response site is within a protected wildlife area or will be in the future. The specific content of the use restrictions, the affected areas, and the basis for establishing the LUC(s) could be affected.
- **State Coastal Zone Management Agencies:** Depending on their specific charter, these state agencies may play a role in establishing or enforcing use restrictions.
- **State Historic Preservation Officers and State Historic Preservation Agencies**: May be stakeholders if the munitions response site is within an area with historical or cultural significance, or the use restriction could affect such areas. The specific content of the use restrictions could be affected.
- **Tribal Governments:** If activities will affect tribal lands, it will be necessary to coordinate with Tribal governments to understand additional requirements and potential issues with establishing controls.

- **Businesses:** Businesses in fishing, water sports, and tourism can be affected.
- **Property/Rights Owners:** Non-navigable waters may be owned by private landowners (or DoD). Water rights include not only the right to access and use the water for recreation, but also to extract the water for various uses (such as irrigation). Mineral rights are the ownership rights to underground resources. Both water and mineral rights may be held by one party, multiple parties, and by parties other than the landowner. Water and mineral rights are typically regulated by states and there is not a standard approach. In some cases, the time that the rights were acquired makes a difference in the limits to the rights that were conveyed.

3.2 Establishing Barriers and Signs in Navigable and Non-navigable Waters

Installing signs and/or barriers within both navigable and non-navigable waters is considered a discharge of fill that is regulated under Section 404 of the Clean Water Act. This activity is also regulated under Section 10 of the Rivers and Harbors Act for navigable waters.

In addition to requirements for discharges of fill, there may also be state and local laws and regulations that apply to establishing controls and installing signs or barriers in navigable and non-navigable waters. These include requirements for placing fill or performing work within waters of the State, ownership of submerged lands, water rights, and mineral rights.

3.2.1 Discharge of Fill

Permits for discharges of fill to WOTUS are issued by USACE. Because installing signs and barriers would typically have no more than a minimal impact or adverse effect on the environment, these activities would be eligible for coverage under a general permit in the Nationwide Permit (NWP) Program described in 33 CFR 330. All permits issued under the Clean Water Act, including NWPs, require a Clean Water Act Section 401 Water Quality Certificate (WQC). While permits are issued by USACE, WQCs are typically issued by state environmental agencies but will be issued by EPA in locations where a state does not have that authority.

The administrative approach to obtaining permit coverage varies both by USACE District and by state. The basic requirements are described in this section; however, consultation with the USACE District governing the water is recommended either for determining the administrative steps related to permit coverage or determining the consultations necessary for establishing substantive requirements for onsite actions taken under CERCLA. As of the time of writing, there are nearly 60 different types of projects included in the program; **Table 3-2** lists the NWPs that may be commonly used for installing LUC signs and barriers.

Table 3-2. Common Nationwide Permits for Offshore Signs and Barriers

NWP Number	Name	Brief Description[a]
1	*Aids to Navigation*	Covers placing aids to navigation and regulatory markers that are approved by and installed in accordance with the requirements of the USCG
3	*Maintenance*	Used to maintain structures that have been previously installed
18	*Minor Discharges*	Minor discharges of dredged or fill material
20	*Response Operations for Oil or Hazardous Substances*	Activities conducted as part of a CERCLA response action including containment, cleanup, and mitigation efforts

Table 3-2. Common Nationwide Permits for Offshore Signs and Barriers

NWP Number	Name	Brief Description[a]
25	*Structural Discharges*	Used to construct structural members where the fill material is placed in forms or cells
32	*Completed Enforcement Actions*	Used to maintain structures installed to comply with an enforcement action
38	*Cleanup of Hazardous and Toxic Waste*	Used to implement remedial actions under various regulatory authorities

[a] The brief descriptions are included for quick reference and are not the complete text describing what the permit can and cannot be used for. Consult the USACE District website governing the water where the project is taking place for the complete text as well as any regional limitations there may be for coverage.

All NWPs are reissued at the federal level every 5 years. They are issued with general conditions that apply to all of the permits and may also have additional permit-specific conditions that apply only to a single NWP. Additional conditions may be added for work within specific regions by the USACE District. States may issue general WQCs for all projects at the time the NWPs are issued at the federal level, may require each project to apply for a separate WQC, or may require some combination of the two. WQCs will also include conditions that apply to the work.

Use of NWPs may or may not require that the project receive advanced verification of coverage by submitting a pre-construction notification (PCN) to the USACE District Engineer. The trigger for this requirement varies by the specific NWP and location. If the project does not require a PCN, the permittee is still responsible for performing the project in accordance with all the conditions – federal, regional, and WQC – associated with the permit.

To comply with the requirements of the NWP, coordination with the following agencies may be required:

- **USCG:** If signs and/or barriers will be placed within navigable waters, the USCG must be consulted for navigational safety requirements.
- **State Environmental or Natural Resources Agencies:** Each state has a different approach to issuing WQCs, so consultation may be necessary on some project details. It should be expected that conditions will include limiting impacts to water quality standards during the work and protecting state listed habitat and species. As previously mentioned, many states claim ownership of the land beneath waters of the State as well as specific control of buffer areas surrounding them. Additional approvals and/or permits could be necessary.
- **Federal and State Fish and Wildlife Protection Agencies:** Consultations are required based on the type of sign or barrier and the method of installation. The National Marine Fisheries Service is responsible for protection of species in saltwater including those that may use freshwater areas occasionally. The U.S. Fish and Wildlife service governs freshwater areas. Some states have additional areas or species that are protected under state law.
- **Coastal Zone Management Agencies:** In some states, coastal zone management agencies would have authority regarding erecting signs or other barriers.
- **Floodplain Management Authority:** In general, structures that are erected in floodplains may be subject to additional permitting or design requirements. Coordination with floodplain managers may be required by the state WQC or by regional conditions.
- **Private Landowners and Other State Agencies**: Where private ownership of submerged lands, water rights, or mineral rights may be a concern, consultation with legal counsel is recommended. If work will be performed on property not owned by the Navy, USACE will typically require proof that access is allowed.

3.2.2 State and Local Laws

Because of the variability in state and local laws, a legal and regulatory review is recommended to identify any additional design, regulatory, and permitting requirements. Most commonly, an approval to access state-owned submerged lands or to perform work in waters of the state is required. There is no common name for these approvals.

In addition, floodplain management authorities typically have design regulations and/or permitting requirements. If consultation is not required by the NWP, compliance with design specifications, regulations, and/or standalone permitting should be evaluated.

4.0 CONCLUSIONS AND RECOMMENDATIONS

With over 400 underwater MRSs in the DoD's inventory, establishing use controls has been and will continue to be an integral component of cleanup under authorities such as CERCLA. This technical report shares a historical perspective on controls implemented at underwater MRSs, along with specific examples of institutional and engineering controls used at DoD sites. In addition, an initial summary is provided of the unique legal, regulatory, policy, and related factors that may affect and/or influence controls at underwater MRSs. A general summary of pros and cons for the controls at underwater MRS is included in **Table 4-1**.

Recommendations for future consideration include the development of NAVFAC guidance to serve as a comprehensive resource to further assist Navy RPMs in planning, implementing, and monitoring controls for underwater MRSs. This could take the form of a comprehensive guidance document, or a series of technical memorandums developed on other key elements unique to establishing controls at underwater MRSs. Topics of interest to further standardize best practices at underwater MRSs could include:

- Types, advantages, and important considerations associated with water-based institutional and engineered controls, including interim versus final use controls
- Monitoring and maintenance, including methodology, assessing effectiveness, optimization, and termination
- Community outreach, including assessing impacts on recreational and/or commercial uses and soliciting and considering community stakeholder input
- Operations, maintenance, and enforceability considerations upon property transfer out of government ownership for Base Realignment and Closure sites

Table 4-1. Pros and Cons for Common Controls for Underwater MRS

Use Control	Brief Description	Pros	Cons
Control Type: Institutional			
USCG Limited Access Areas (Safety Zones and Security Zones)	A water area, shore area, or water and shore area to which, for safety or environmental purposes, access is limited to authorized persons, vehicles, or vessels. Access to these areas is completely prohibited without authorization from the COTP or the District Commander in that jurisdiction (33 CFR 165, Subpart C). Or area of land, water, or land and water that is designated for such time as is necessary to prevent damage or injury to any vessel or waterfront facility, to safeguard ports, harbors, territories, or waters of the United States or to secure the observance of the rights and obligations of the United States (33 CFR 165, Subpart D). When established, navigational charts may be updated, if applicable, or a Local Notice to Mariners may be published. These zones are enforced by the USCG and/or partner agencies, as agreed or applicable.	Limited Access Areas are typically used for temporary needs. Well-suited to investigation and response activities that have short-term hazards.	Not appropriate for final remedies. Intended to address hazards to navigation. May not be well suited to recreational activities that are not related to vessel navigation. May be difficult to enforce without clear agreements with stakeholder or partner agencies.
USCG Regulated Navigation Area	A water area within a defined boundary for which regulations for vessels navigating within the area have been established. These regulations could control times of vessel entry, movement, or departure; establish limitations on vessel size, speed, draft, and operating conditions; and restrict vessel operation to only those which have particular operating characteristics or capabilities. (33 CFR 165, Subpart B). When established, navigational charts would be updated and the zone would be enforced by the USCG and/or partner agencies, as agreed.	More permanent control established by the District Commander. Appropriate for long-term and persistent hazards.	Must be established by the District Commander. Not well suited for temporary needs. Intended to address hazards to navigation. May not be well-suited to recreational activities that are not related to vessel navigation. May be difficult to enforce without clear agreements with stakeholder or partner agencies.

Table 4-1. Pros and Cons for Common Controls for Underwater MRS

Use Control	Brief Description	Pros	Cons
USACE Danger Zone	A defined water area (or areas) used for target practice, bombing, rocket firing, or other especially hazardous operations, normally for the armed forces. The Danger Zones may be closed to the public on a full-time or intermittent basis [33 CFR 334.2(a)]. When established, navigational charts would be updated, if applicable. The zone would be enforced by the USACE and partner agencies, as agreed.	May already be in place if the underwater MRS is used as an active range or proving ground. Typically, would apply to areas with active operations.	Requires CFR Rulemaking to establish. If not an active range or facility, may be difficult to enforce without clear agreements with stakeholder or partner agencies.
USACE Restricted Area	A defined water area for the purpose of prohibiting or limiting public access to the area. Restricted Areas generally provide security for Government property and/or protection to the public from the risks of damage or injury arising from the Government's use of that area [33 CFR 334.2(b)]. When established, navigational charts would be updated, if applicable. The zone would be enforced by the USACE and partner agencies, as agreed.	May already be in place if the underwater MRS is used as an active range or proving ground. Well-suited to permanent remedies	Requires CFR Rulemaking to establish. May be difficult to enforce without clear agreements with stakeholder or partner agencies.
Deed Restrictions / Environ-mental Covenants or similar	Adding restrictions on land use to property that is recorded through a deed notice and binding in perpetuity. At active DOD installations, may also be implemented through other administrative means without a deed or covenant.	Well-suited to non-navigable waters if implemented while still owned by DOD, prior to transfer. Can be well suited for non-navigable waters not owned by DOD with cooperation from private landowner.	Difficult to implement on property that is not owned by DOD. May be difficult to navigate legal rights of stakeholders regarding water use.

Table 4-1. Pros and Cons for Common Controls for Underwater MRS

Use Control	Brief Description	Pros	Cons
Informational devices	Educate and inform affected parties through non-engineered means, including: • RAB meetings • 3R messaging • Local Notice to Mariners • Social medial postings • Informational brochures, flyers, newsletters, and website postings for land management and other agencies to provide with permits/information requests.	Low cost Fast implementation	By nature, informational devices are not enforceable (i.e., requires individual or public interest and compliance), but can be readily coupled with enforceable mechanisms to enhance effectiveness.
Control Type: Engineering			
Waterway barriers installed in navigable waters.	Physical waterway barriers to raise hazard awareness and deter trespassing.	Increase visibility of restricted areas. Extend the reach of controls to members of the public not reached through other means	Require permitting (or CERCLA consultations) under Section 404 of the Clean Water Act and/or Section 10 of the Rivers and Harbors Act. Costs and timelines for permitting and consultations vary. May not be appropriate for larger areas, especially based on potential impact to navigation. May pose risks to protected species and habitat. Likely high costs for materials and/or maintenance.
Waterway barriers installed in non-navigable waters.	Physical waterway barriers to raise hazard awareness and deter trespassing.	Increase visibility of restricted areas. Extend the reach of controls to members of the public not reached through other means.	Require permitting (or CERCLA consultations) under Section 404 of the Clean Water Act. Costs and timelines for permitting and consultations vary. May have additional stakeholders if on private property. May be of limited value in non-navigable waters. May pose risks to protected species and habitat. Likely high costs for materials and maintenance.

Table 4-1. Pros and Cons for Common Controls for Underwater MRS

Use Control	Brief Description	Pros	Cons
Warning or educational signs and/or buoys in navigable waters	Warning and educational signs in the waterway to raise hazard awareness and deter trespassing.	Increase visibility of restricted areas. Extend the reach of controls to members of the public not reached through other means. Educate public on the hazards.	Require permitting (or CERCLA consultations) under Section 404 of the Clean Water Act and/or Section 10 of the Rivers and Harbors Act. Costs and timelines for permitting and consultations vary. Potentially high costs for maintenance.
Warning or educational signs in non-navigable waters	Warning and educational signs in the waterway to raise hazard awareness and deter trespassing.	Increase visibility of restricted areas. Extend the reach of controls to members of the public not reached through other means. Educate public on the hazards.	Require permitting (or CERCLA consultations) under Section 404 of the Clean Water Act. Costs and timelines for permitting and consultations vary. May have additional stakeholders if on private property. May be of limited value in non-navigable waters where encounters may be limited and/or on private property where access is otherwise restricted. Potentially high costs for maintenance.
Warning or educational signs outside of the waterway	Warning and educational signs outside of the waterway to raise hazard awareness and deter trespassing.	Increase visibility of restricted areas. Extend the reach of controls to members of the public that are not reached through other means. Educate public on the hazards. Installation and maintenance costs lower than installation in waterway. May be more effective in capturing attention in advance of the hazard. May be more effective than posting signs in non-navigable waters or on private property.	May have additional stakeholders if on private property. May be missed by some members of the public. Potentially high costs for maintenance.

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APPENDIX A: PHOTOGRAPH LOG

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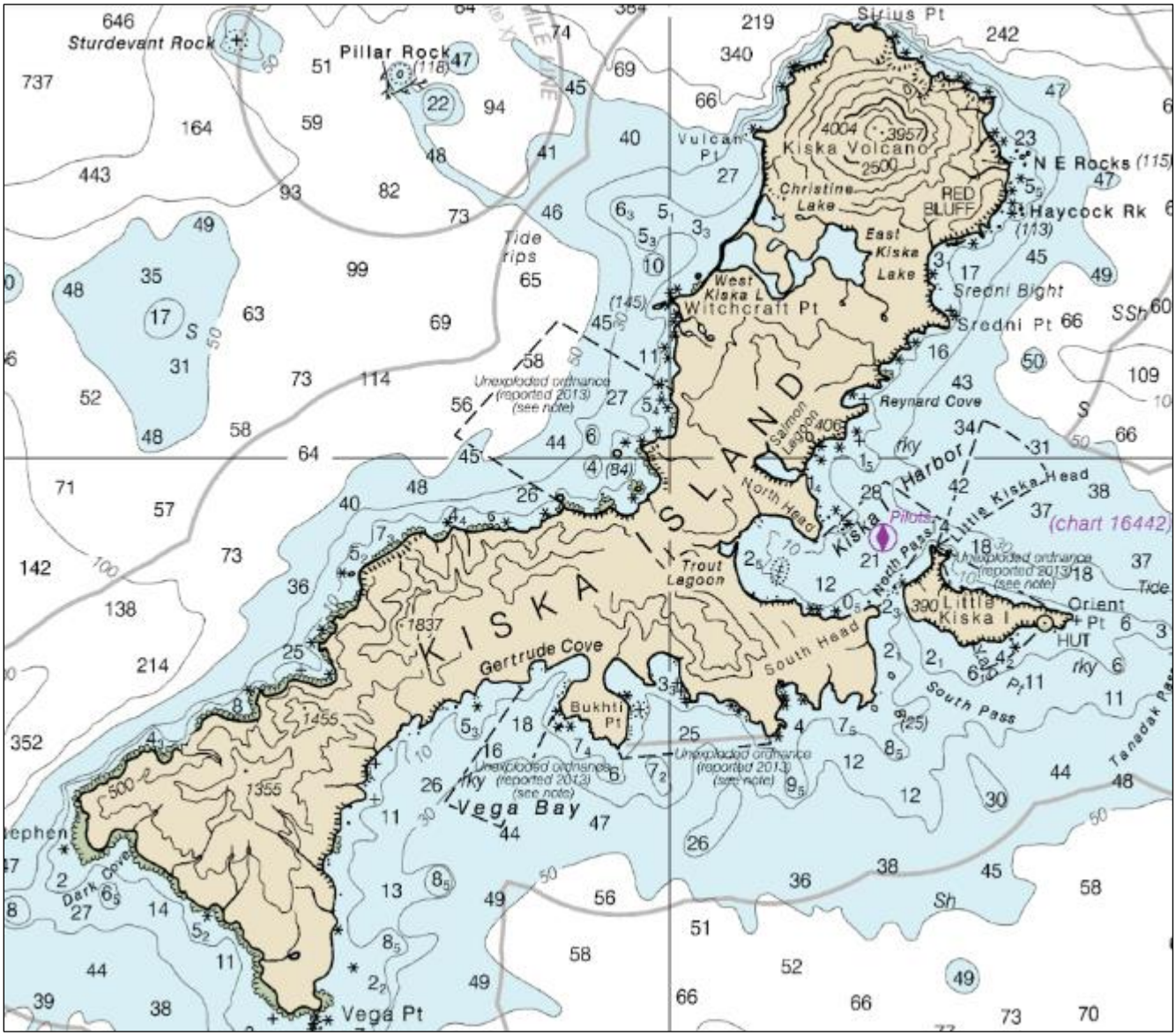


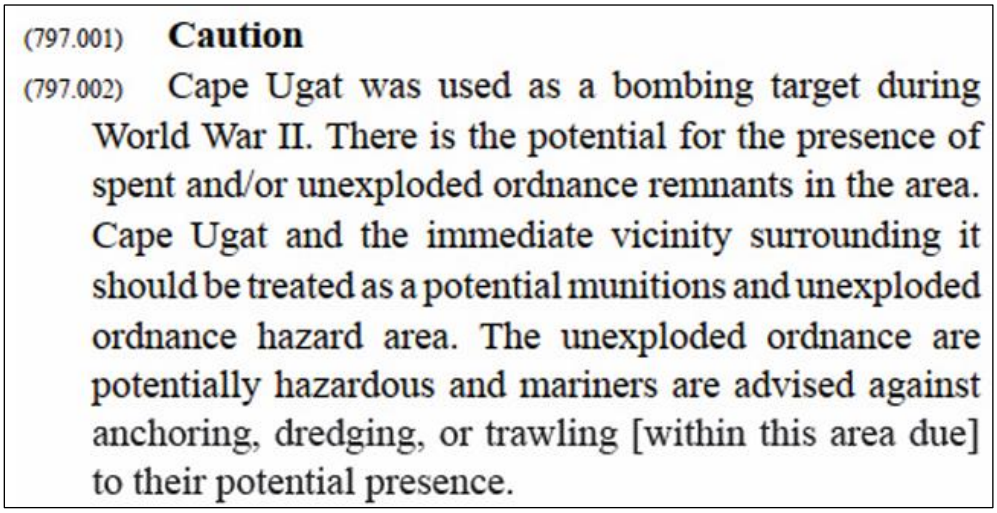
Source: NOAA, 2015
Photograph 1

411 **ALASKA – SOUTHWESTERN – ALEUTIAN ISLANDS**

Six former in-water ranges within Naval Defensive Sea Area Kiska Island have been identified as potentially containing munitions and explosives of concern (MEC). The boundaries of the six former in-water ranges are identified as black, dotted lines on the NOAA Navigational Charts with text as follows: "Unexploded ordnance (reported 2013, see note)." Mariners are cautioned against anchoring, dredging or trawling within these areas. Mariners should follow the 3Rs – Recognize, Retreat, and Report (https://www.denix.osd.mil/uxo/home/). Recognize possible munitions such as mines, torpedoes, depth charges, artillery shells, bombs, and missiles. Mariners should avoid military and former military ranges and disposal areas, and explosive hazard areas identified on Navigational Charts. Retreat by staying as far away as possible, not bringing munitions onboard or into port, minimizing disturbance (i.e., not touching or bumping munitions), and safely jettison, if possible. Report immediately to the U.S. Coast Guard District 17 Command Center at 907-463-2000 if encountering possible munitions and provide vessel position, activity being conducted (anchoring, fishing, dredging), description of munition item, and action taken (i.e., munition stowed or jettisoned). For additional information: Call U.S. Army Technical Center for Explosives Safety at 918-420-8919 or see the US Army's UXO Safety Education website: https://www.denix.osd.mil/mmrp/index.html. Also see the Navy's website for specific documents related to the Aleutian Islands: https://www.navfac.navy.mil/navfac_worldwide/pacific/fecs/northwest/about_us/northwest_documents.html

LNM: 20/22

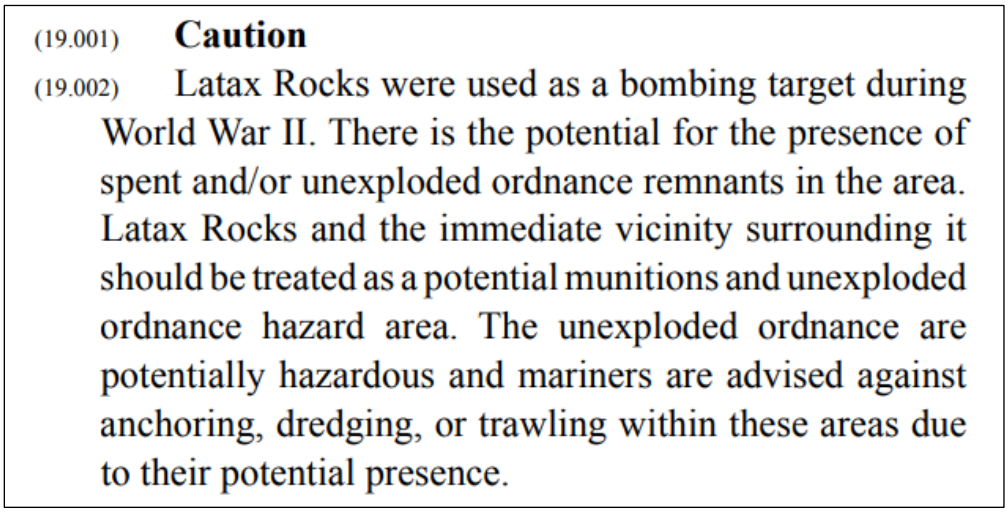
Source: USCG, 2023
Photograph 2



(797.001) **Caution**

(797.002) Cape Ugat was used as a bombing target during World War II. There is the potential for the presence of spent and/or unexploded ordnance remnants in the area. Cape Ugat and the immediate vicinity surrounding it should be treated as a potential munitions and unexploded ordnance hazard area. The unexploded ordnance are potentially hazardous and mariners are advised against anchoring, dredging, or trawling [within this area due] to their potential presence.

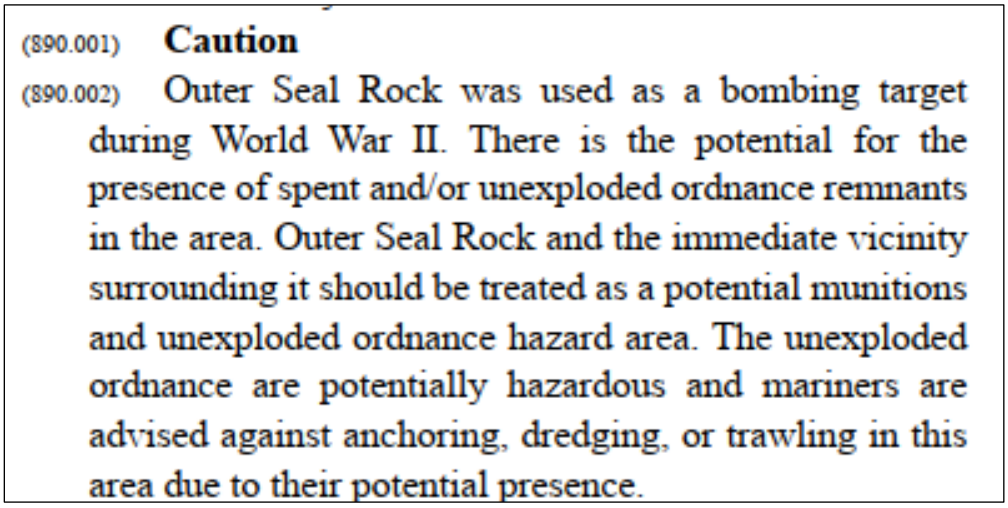
Source: NOAA, 2024
Photograph 3



(19.001) **Caution**

(19.002) Latax Rocks were used as a bombing target during World War II. There is the potential for the presence of spent and/or unexploded ordnance remnants in the area. Latax Rocks and the immediate vicinity surrounding it should be treated as a potential munitions and unexploded ordnance hazard area. The unexploded ordnance are potentially hazardous and mariners are advised against anchoring, dredging, or trawling within these areas due to their potential presence.

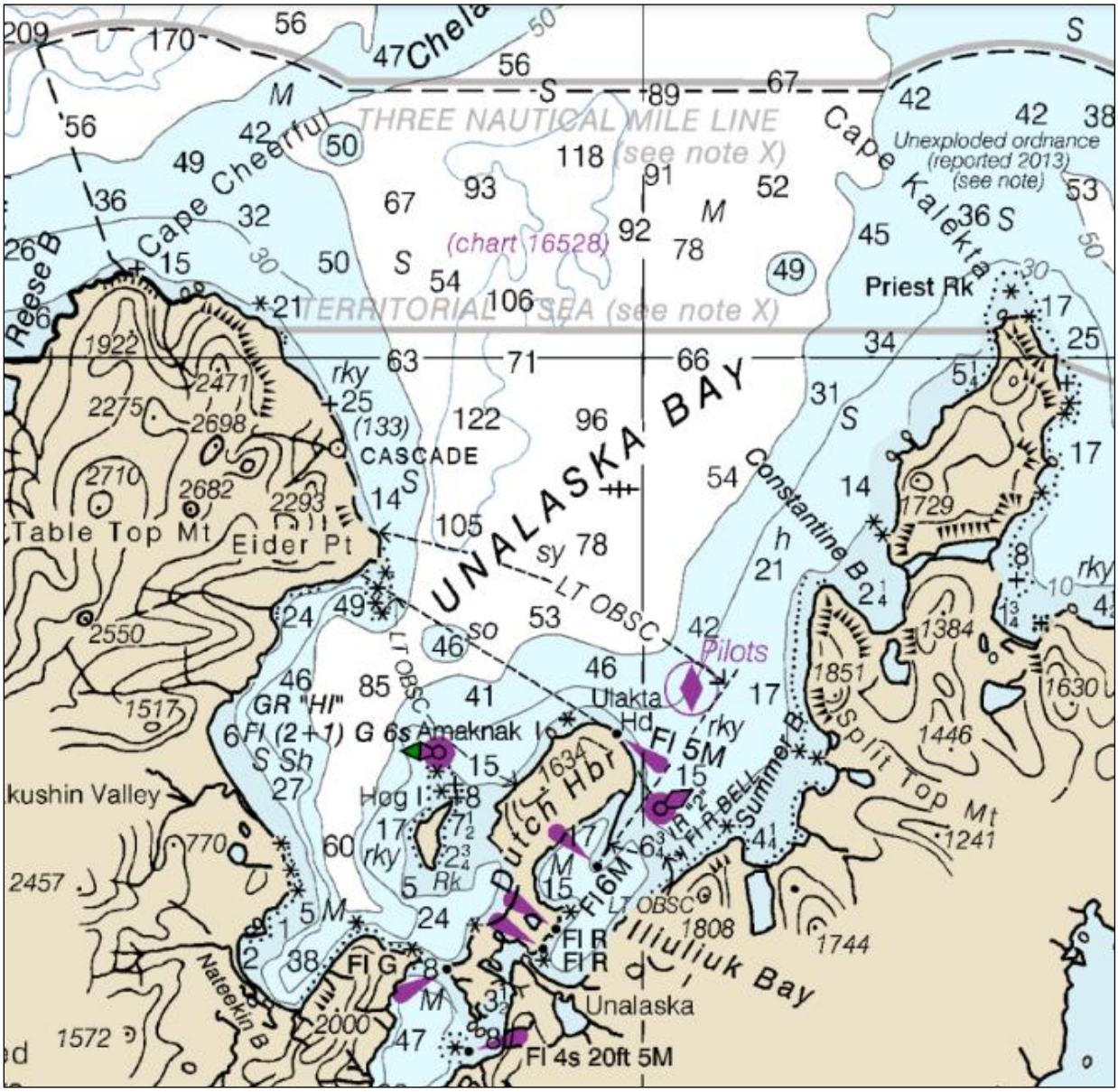
Source: NOAA, 2024
Photograph 4



(890.001) **Caution**

(890.002) Outer Seal Rock was used as a bombing target during World War II. There is the potential for the presence of spent and/or unexploded ordnance remnants in the area. Outer Seal Rock and the immediate vicinity surrounding it should be treated as a potential munitions and unexploded ordnance hazard area. The unexploded ordnance are potentially hazardous and mariners are advised against anchoring, dredging, or trawling in this area due to their potential presence.

Source: NOAA, 2024
Photograph 5



Source: NOAA, 2015
Photograph 6

155 **ALASKA – SOUTHWESTERN – UNALASKA ISLAND**

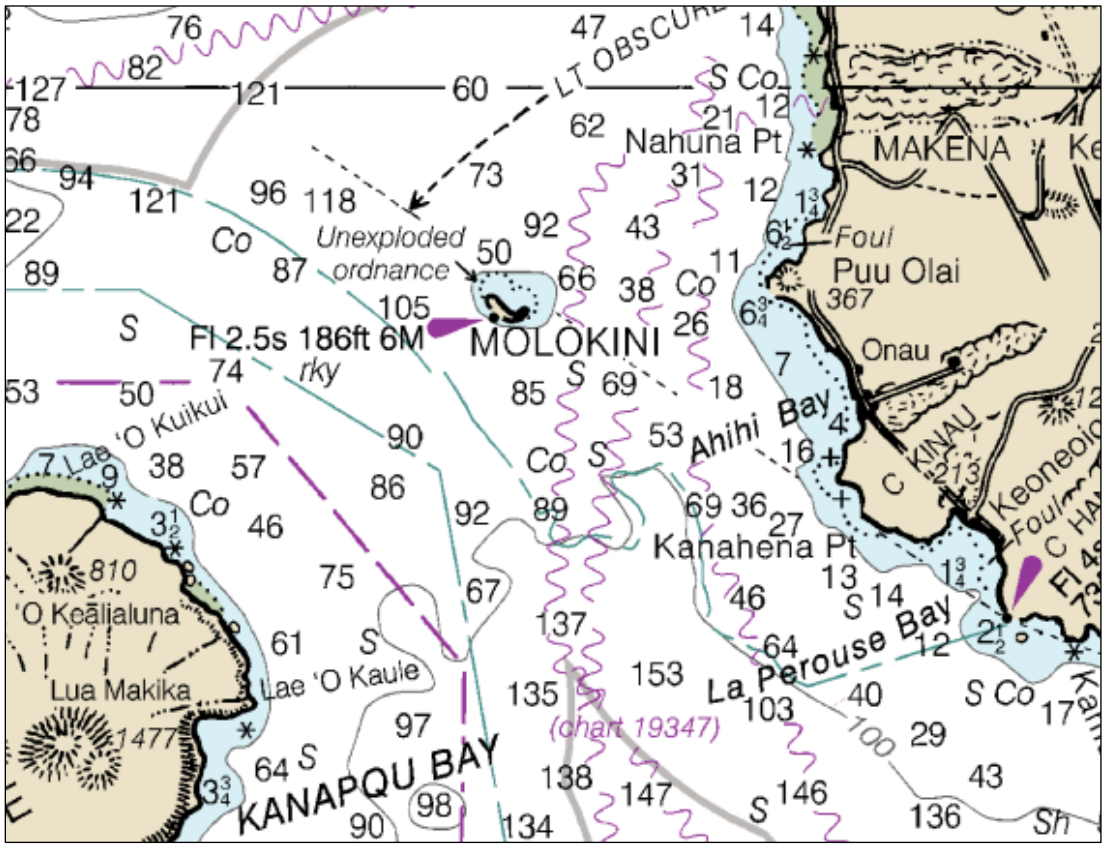
Unalaska Island is situated within the Naval Defensive Sea Area, which has been identified as containing munitions and unexploded ordnance. A former in-water range is located within the western area of Unalaska Bay, identified as black dotted lines on applicable National Oceanic and Atmospheric Administration (NOAA) Navigational Charts with text as follows: "Unexploded ordnance (reported 2013, see note)." Specific areas around Unalaska Island contain Munitions of Explosive Concern (MEC) within the marine environment. A former 1947 Ordnance Disposal Area containing unexploded ordnance is located approximately 12NM North of Reese Bay, Unalaska Island (54º11'00"N, 166º41'00"W). In addition, unexploded ordnance has been identified within fishing nets at a location approximately 6.5NM North of Cape Cheerful (54º06'29"N, 166º38'01"W). Munitions and unexploded ordnance has also been identified in the nearshore waters of Unalaska Bay near Eider Point, Mutton Cove, Southwest Dutch Harbor near Rocky Point, and Southeast Iliuliuk Bay near the Dutch Harbor Landfill. The unexploded ordnance are potentially hazardous and mariners are cautioned against anchoring, dredging, or trawling within these areas due to their potential presence.

Mariners should follow the 3Rs – Recognize, Retreat, and Report (https://www.denix.osd.mil/uxo/). Recognize possible munitions such as mines, torpedoes, depth charges, artillery shells, bombs, and missiles. Mariners should avoid military and former military ranges and disposal areas, and explosive hazard areas identified on Navigational Charts. Retreat by staying as far away as possible, not bringing munitions onboard or into port, minimizing disturbance (i.e., not touching or bumping munitions), and safely jettisoned, if possible. Report immediately to the U.S. Coast Guard Sector Anchorage Command Center on VHF/FM channel 16 or by phone to 907-428-4100 if an encounter with possible munitions occurs and

Source: USCG, 2023b
Photograph 7

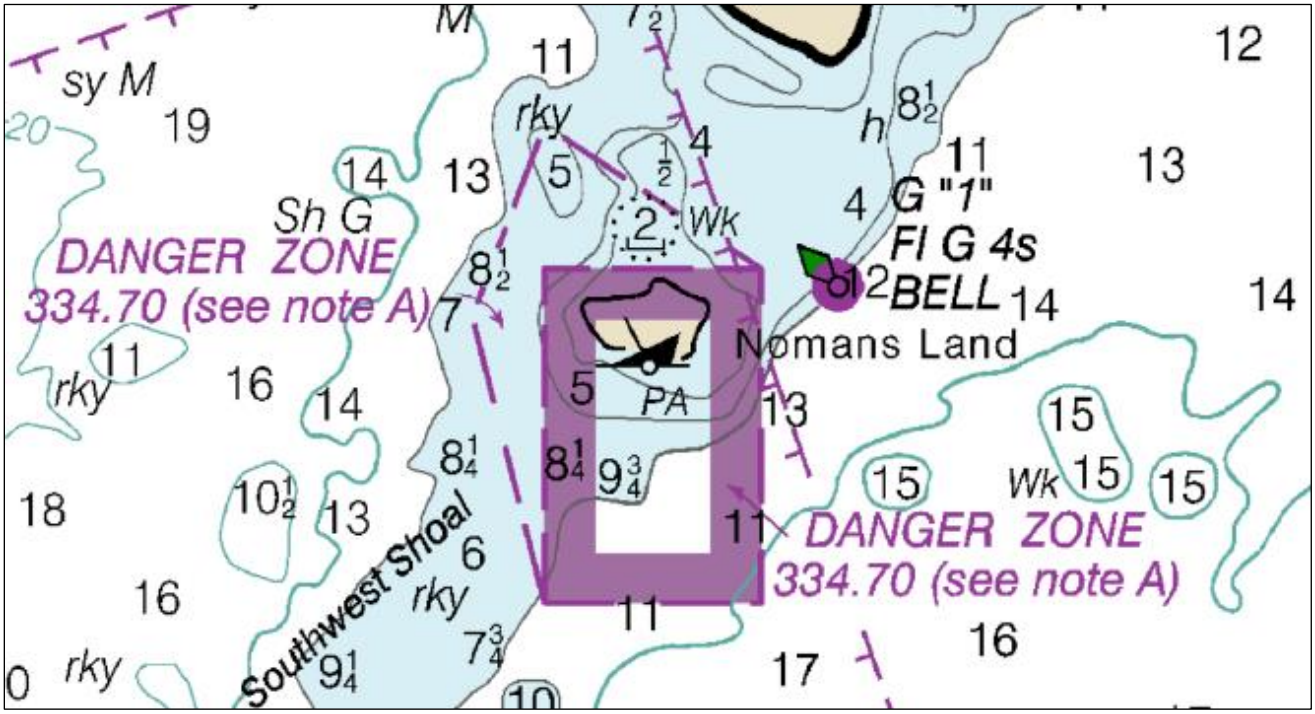
Source: MauiNow, 2020

Photograph 8



Source: NOAA, 2008
Photograph 9

Source: USFWS, 2010
Photograph 10



Source: NOAA, 2012
Photograph 11

§ 334.70 Buzzards Bay, and adjacent waters, Mass.; danger zones for naval operations.

(a) *Atlantic Ocean in vicinity of No Mans Land* —

(1) ***The area.*** The waters surrounding No Mans Land within an area bounded as follows: Beginning at latitude 41°12'30", longitude 70°50'30"; thence northwesterly to latitude 41°15'30", longitude 70°51'30"; thence northeasterly to latitude 41°17'30", longitude 70°50'30"; thence southeasterly to latitude 41°16'00", longitude 70°47'30"; thence south to latitude 41°12'30", longitude 70°47'30"; thence westerly to the point of beginning.

(2) ***The regulations.*** No vessel or person shall at any time enter or remain within a rectangular portion of the area bounded on the north by latitude 41°16'00", on the east by longitude 70°47'30", on the south by latitude 41°12'30", and on the west by longitude 70°50'30", or within the remainder of the area between November 1, and April 30, inclusive, except by permission of the enforcing agency.

(3) The regulations in this paragraph shall be enforced by the Commandant, First Naval District, and such agencies as he may designate.

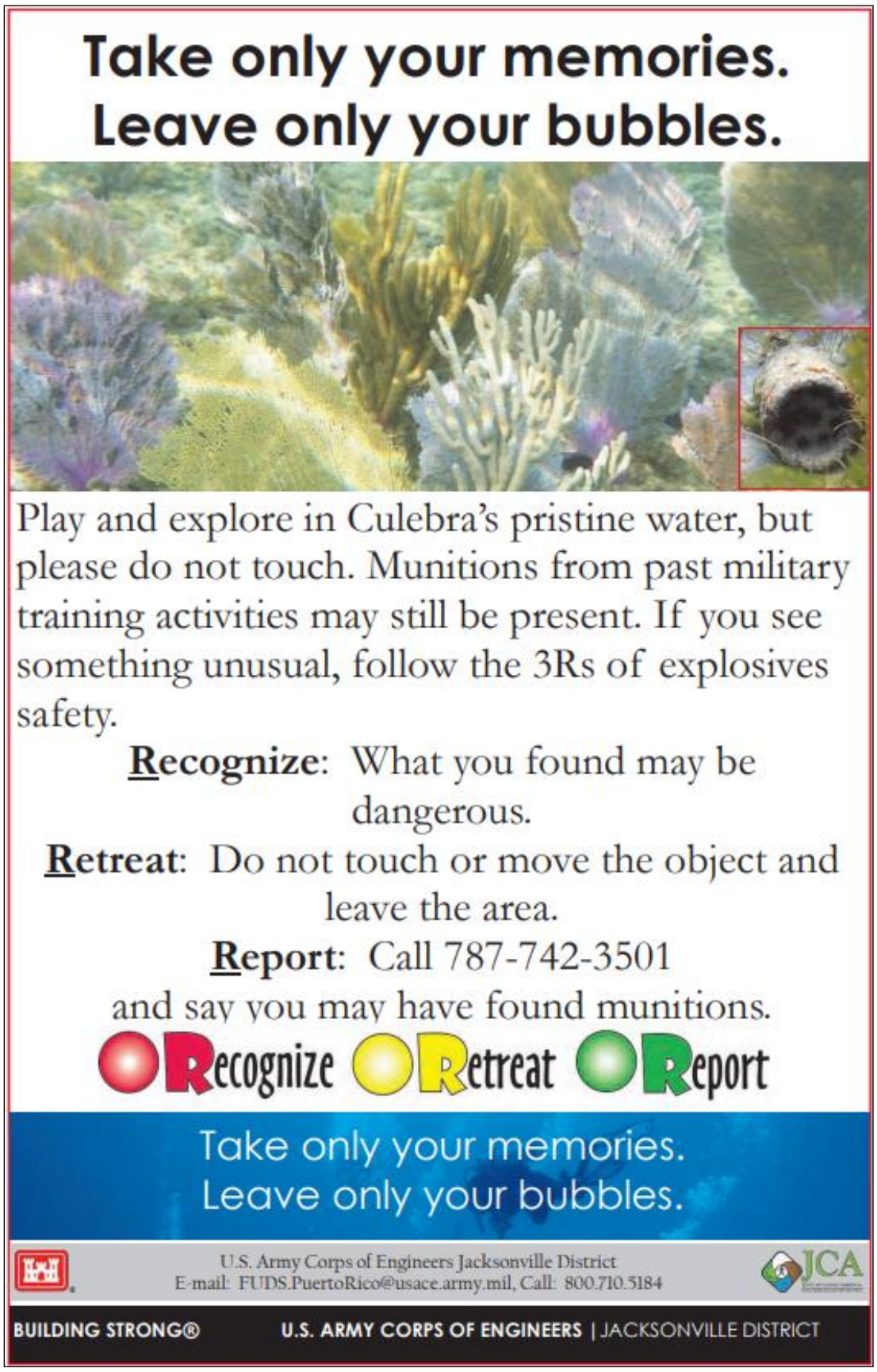
[26 FR 11195, Nov. 28, 1961, as amended at 27 FR 10296, Oct. 20, 1962; 33 FR 10930, Aug. 1, 1968. Redesignated at 50 FR 42696, Oct. 22, 1985, as amended at 62 FR 17552, Apr. 10, 1997; 79 FR 48691, Aug. 18, 2014]

Source: 33 CFR 334.70

Photograph 12

Source: U.S. Marine Corps, 2017
Photograph 13

Photos from Publicly Distributed Information Products.
Source: USACE, 2005
Photograph 14



Source: USACE, 2018
Photograph 15

Source: Photos from Jacobs Inspections
Photograph 16

Source: Boster, 2022.
Photograph 17

EXPLOSIVES SAFETY

Lunga Park is part of Marine Corps Base (MCB) Quantico and was utilized as a military training area over 50 years ago before becoming a recreational area. Although extensive cleanup actions for munitions have been performed at Lunga Park and across Marine Corps Base Quantico, it is possible that munitions presenting an explosive hazard may be encountered at Lunga Park and other portions of Marine Corps Base Quantico. Munitions are projectiles, bombs, hand grenades, and other types of items that the military use in training and combat. A common term used for munitions that have not detonated is unexploded ordnance (UXO).

Munitions discovered on the premise. DO NOT TOUCH. Report immediately.

Munitions are designed to be dangerous and can explode if approached, touched, moved, or disturbed. Recreation area visitors should follow the 3Rs of explosives safety when visiting Lunga Park.

3Rs

1. RECOGNIZE: When you may have encountered a munition and that munitions are dangerous.

2. RETREAT: Do NOT approach, touch, move, or disturb the item; carefully leave the area.

3. REPORT: Report the item and location to recreation area staff or military police.

Source: MCCS, 2023
Photograph 18

Source: USFWS, 2004
Photograph 19

Source: USACE, 2009
Photograph 20

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