



Proposed Remedial Action Plan

Nomans Land Island
Chilmark, Massachusetts

The Proposed Remedial Action Plan

This Proposed Remedial Action Plan (Proposed Plan) has been prepared in accordance with federal and state law to present the United States (U.S.) Department of the Navy's (Navy's) preferred remedy of **Institutional Controls/Public Awareness and Enforcement** to address the risks to human health and the environment for Nomans Land Island, located south of Martha's Vineyard, Massachusetts. The Navy has prepared this Proposed Plan after careful study of the Site, and in accordance with federal and state law and in coordination with federal and state environmental regulatory agencies. This document provides the public with information regarding this plan and describes how to become involved in the decision-making process.

Introduction

This Proposed Plan provides information to the public regarding the decision to implement a preferred remedial alternative consisting of Institutional Controls/Public Awareness and Enforcement program for Nomans Land Island (hereinafter referred to the island and/or the Site), which is incorporated as part of Chilmark, Massachusetts (see **Figure 1**). The Site is defined as:

- All upland soils, sediments, groundwater, and surface water above the mean-low water level; and
- The direct near-shoreline marine environment (surface water and marine sediments).

Nomans Land Island was used by the Navy as an air-to-surface target range from 1943 until 1996, with aerial bombing training operations managed on the island from Naval Air Station South Weymouth (NAS SOWEY). Information regarding the history of the Site and contamination that was identified at the Site is provided on the following pages of this Proposed Plan. This includes environmental investigations, starting in 1996, which identified both chemical and munitions related contamination in the soil and near the shoreline, as well as several soil and munitions Release Abatement Measures (RAMs) and risk and safety assessments conducted under the Massachusetts Contingency Plan (MCP). Based on a series of Site risk and safety assessments and prior remedial actions, that addressed potential chemical

Let us know what you think!

Mark Your Calendar!

PUBLIC COMMENT PERIOD



September 15 through October 15, 2020

The Navy will accept written comments on the Proposed Plan during this period. Send written comments postmarked no later than October 15, 2020 to:

Mr. Dave Barney
BRAC Environmental Coordinator
BRAC Program Management Office, East
PO Box 169
South Weymouth, MA 02190

or email your comments to:
david.a.barney@navy.mil

VIRTUAL PUBLIC INFORMATION SESSION AND PUBLIC HEARING – September 29, 2020

The Navy will hold a virtual public information meeting beginning at 7:00 p.m. that will include a presentation describing the Proposed Plan and a question-and-answer session. A virtual public hearing will follow starting at 8:00 p.m., during which the Navy will accept and record verbal comments on the Proposed Plan. All comments will be addressed in the Responsiveness Summary to be included in the Record of Decision. Instructions to access the public meeting and hearing webinar are included on page 18 of this Proposed Plan.

For more information, visit one of the Information Repositories listed at the end of this Proposed Plan.

contamination, it was determined the Site no longer poses a significant risk to human health, public welfare, and the environment, given the identified future use of the island as an unstaffed national wildlife refuge. However, the assessment of risk to public safety revealed that a potential explosives safety concern exists due to the presence of residual unexploded ordnance (UXO) on the island. This Proposed Plan is intended to present the rationale for proposing the Institutional Controls and Public Awareness decision for the island and to encourage and facilitate public participation in the decision-making process. The Navy has prepared this Proposed Plan based on thorough

phased investigations and evaluations that were conducted in accordance with the MCP. The Proposed Plan also meets requirements of the federal Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), better known as Superfund. Both the MCP and CERCLA established procedures for investigating and cleaning up environmental concerns at sites.

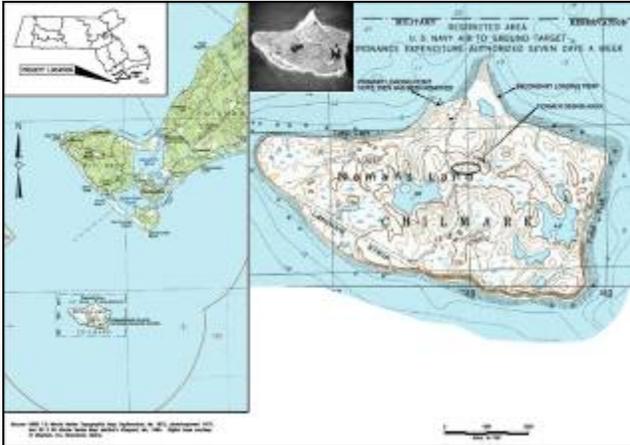


Figure 1 – Location map for Nomans Land Island

The Navy (as the Lead Agency in the environmental cleanup of the Site) worked closely with the Massachusetts Department of Environmental Protection (MassDEP) and the U.S. Fish and Wildlife Service (USFWS) in their environmental investigations at Nomans Land Island. The USFWS will maintain the Site as an unstaffed national wildlife refuge as part of the Eastern Massachusetts National Wildlife Refuge Complex. The Navy and the U.S. Department of the Interior entered into a Joint Wildlife Management Agreement for Nomans Land Island in 1970, designating the entire island as a National Wildlife Refuge in recognition of known wildlife nesting habitats. The island was transferred in June 1998 from the U.S. Department of Defense (DoD) to the USFWS for the intended use as a national wildlife refuge. The USFWS is the current owner and operator of the island.

The Navy has prepared this Proposed Plan in accordance with CERCLA Section 117(a) and Section 300.430(f)(2) of the National Oil and Hazardous Substances Pollution Contingency Plan to fulfill its public participation responsibilities and to formally present the preferred alternative from the Phase III/Feasibility Study Report. The purpose of this Proposed Plan is to:

- Provide information about the environmental investigations and assessments completed at the Site;
- Provide a brief summary describing remedial alternatives evaluated to address remaining safety concerns;
- Identify and explain the preferred remedial alternative for addressing the remaining safety concerns;

- Solicit public review and comment on the Proposed Plan; and
- Provide information on how the public can participate in the decision-making process.

This Proposed Plan summarizes key information that has been presented in several previous investigations, risk assessments, and remedial actions and munitions and explosives of concern (MEC) surface clearance completion reports. For the purpose of discussing the history of the Site, the Site has been divided into three areas:

1. Former Target Areas
2. Former Debris Area (FDA)
3. Near-Shoreline Environment

A **list** of primary documents with a summary of conclusions prepared for the Site is provided at the end of this Proposed Plan on page 19. These and other Site-related documents are available for public review at the Information Repositories for Nomans Land Island (locations are provided at the end of this document).

The Navy encourages members of the public to review the investigation, assessment, and completion reports to gain a better understanding of environmental activities completed for the Site and to provide the Navy with any comments or concerns.

Site Background: The Environmental Cleanup Process and Nomans Land Island

Nomans Land Island was included in an Environmental Baseline Survey (EBS) conducted for NAS SOWEY in 1996. This EBS included a review of past operations and activities on the island and a site visit. These activities resulted in the identification of nine “Review Items”. The Review Items were conditions or features identified as warranting further evaluation. These Review Items were investigated and/or remediated under the State cleanup program, the MCP, specifically through completing a series of phased investigations and assessments and implementing focused RAMs.

The MCP process was followed during investigation of the environmental impacts from past military operations on the island. The CERCLA and the MCP programs use a similar approach to performing site characterization, remediation, and closure activities. Each step in the process was completed by the Navy with input and review by MassDEP. As the environmental program progressed, MassDEP was the lead regulatory agency for the Site. MassDEP now considers the compliance status of Site to be “adequately regulated”, and the CERCLA process is now being following to meet regulatory requirements. The

MassDEP compliance status is provided at: <https://eeaonline.eea.state.ma.us/portal#!/wastesite/4-0013390>.

To address the EBS Review Item pertaining to ordnance remaining on the surface of the ground on the island and the presence of possible underground storage tanks (USTs), the Navy implemented two focused RAMs in 1998 to remove the surface ordnance and to remove four USTs. Furthermore, as part of the standard MCP process, samples were collected on the island during a Phase I investigation and were analyzed for the presence of contaminants of potential concern (COPCs). The results were screened against human health and ecological risk-based benchmarks. The human health risk-based screening benchmarks that were used in this evaluation were the conservative MCP “Reportable Concentrations” reflecting potential unrestricted exposure to the soil (RCS) (i.e., the RCS-1 benchmarks that are associated with the MCP “S-1” soil category) and the potential drinking of groundwater (RCGW) (i.e., the RCGW-1 benchmarks associated with the MCP “GW-1” groundwater classification). The initial finding based on the limited Phase I information was that there was no significant risk to human health or public welfare.

A Phase II Comprehensive Site Assessment (CSA) subsequently was implemented to further delineate the extent of the COPCs on the island. This evaluation found that a risk to the environment was present due to elevated levels of certain COPCs (in particular, lead, cadmium, chromium, and zinc) in Site soils near the primary target areas and at the FDA, where old military Quonset huts had been disposed of. Based on a discussion with MassDEP and the USFWS, an Environmental Risk Management Memorandum was developed that provided a more detailed assessment of the risk to the environment on the island. This more detailed assessment revealed that the COPCs remaining in the upland soils at the Site posed no significant risk to the environment. However, the source material (i.e., metal debris from the old Quonset huts), located along the slope of the FDA, was linked to impacts to a wetland area located directly downgradient. Therefore, a RAM was implemented in 2006 to remove these source materials. The removal effort resulted in a finding of no significant risk to environment for the entire island, as described in a Phase III/Feasibility Study Report.

In 1998, a Technical Review Committee (TRC) was established for the project to provide presentation and review opportunities for project stakeholders and the public. Project stakeholders include the town of Chilmark, town of Aquinnah, Wampanoag Tribe of Aquinnah, the Navy, the United States Environmental Protection Agency (USEPA), MassDEP, and the USFWS.

In 2001, the TRC determined that further information was necessary to understand past operations at the Site. As a

result, the Navy performed a Supplemental EBS (SEBS). This SEBS included the following activities:

- Aerial photogrammetric survey;
- Airborne geophysical survey;
- Aerial photograph analysis of the Site;
- Review of military documentation;
- Development of an extensive geographical information system (GIS);
- SEBS fieldwork (investigation and sampling associated with 19 Review Items);
- RAM to remove/close one UST, two drywells, and one septic system; and
- Preparation of a SEBS Completion Report.

Nineteen additional Review Items identified during the SEBS were investigated, assessed, and closed with MassDEP concurrence. One additional UST was removed (along with petroleum-contaminated soils), one septic system was closed, and two drywells were closed.

Ecological risk-based benchmarks have been established for all representative ecological receptor groups (aquatic life and island wildlife) present in the habitats of the island. Environmental media to which these receptor groups are exposed were considered in the risk assessments to assess on-island exposure to these receptor groups.

All detected COPCs exceeding the conservative ecological risk screening benchmarks were compared to established background levels. The background levels were developed from analytes detected in non-target area samples collected from areas where historical target range activities were minimal. Background samples were collected as part of the Phase I and Phase II investigations and the SEBS investigations. Background levels are described in the Final CSA Report.

The Navy performed risk assessments using data collected from the Phase I and Phase II environmental investigations. Based on the risk assessments, the Navy concluded that a level of “No Significant Risk” exists for the human health, environment, and public welfare aspects of the Site. Due to the continued presence of ordnance at the Site, a level of “No Significant Risk” could not be established for the risk of harm to safety aspect. For this reason, the Navy proposes to establish an Institutional Controls / Public Awareness and Enforcement program as the preferred remedial action alternative, and to maintain the island in the future as an unstaffed national wildlife refuge. The MassDEP has concurred with this finding.

As part the response to the risk of harm to safety due to the presence of ordnance, four MEC surface clearance events were conducted, in 1998, 2003, 2008 and 2014. MEC

located on or protruding from the surface that could potentially pose a hazard within the accessible shoreline or along roadways was removed and disposed.

Information about the Target Areas, the FDA, and the Near-Shoreline Area is provided below. Documents associated with these sites and referenced in this Proposed Plan are listed in a table provided on **page 16**.

Site Background: Risk Assessments

In accordance with the MCP, the Navy conducted two phases of risk assessment to identify and quantify the potential effects of the COPCs on human health and the environment now and in the future, given the anticipated future use of the island. Additional assessments also were conducted to evaluate the potential risks to public welfare and to safety, as defined under the MCP. A wide range of probable and possible exposure scenarios was evaluated in the risk assessments, as discussed below. The types and magnitude of the potential effects associated with these scenarios were considered in making decisions regarding the future management and use of the island.

How are the Risks Expressed?

It depends on the type of chemical. For potential carcinogens, the risk to human health is expressed in terms of the probability of the chemical causing cancer over an estimated lifetime of 70 years. USEPA's acceptable risk range for carcinogens is from 1 in 1,000,000 to 1 in 10,000. In general, excess lifetime cancer risks calculated to be greater than 1 in 10,000 require consideration of cleanup alternatives and remedial response. MassDEP uses an excess lifetime cancer risk of 1 in 100,000 as the threshold.

For non-carcinogens, the risk to human health is expressed as a Hazard Index (HI). For both the USEPA and MassDEP, an HI greater than 1 suggests that adverse health effects from exposure at that level are possible.

Human Health Risks

A multi-chemical, multi-pathway human health risk assessment (HHRA) was performed to estimate the likelihood of health problems occurring for the identified users of the island if contaminants were to remain on site. To estimate the baseline risk to human health, a four-step process was used.

Step 1 – Hazard Identification

COPCs were identified as those chemicals with detected concentrations that exceeded benchmark screening levels and background levels, if applicable. The COPCs included metals, pesticides, selected volatile organic compounds (VOCs), petroleum-related constituents, and residual explosives in the soil. The COPCs identified in the island sediments consisted of metals only. The COPCs identified in the upland surface water consisted of metals and one explosive residual. The COPCs identified in groundwater consisted of metals and VOCs. Site-specific risk calculations (i.e., Steps 2 through 4, below) were performed for each identified COPC in each exposure medium.

Step 2 – Exposure Assessment

The exposure assessment examines the possible pathways by which humans may come into contact with the COPCs in the soil, water, or sediment at the Site during current or future activities and receive a dose of the COPCs. Under the current use scenario, potential exposures and doses to on-site USFWS workers performing routine refuge management activities and adult and child trespassers were evaluated. Potential exposure routes associated with the current use scenario included dermal absorption through the skin (i.e., associated with direct contact), incidental ingestion, and inhalation of particulates or vapors associated with the impacted environmental media on the island. Potential exposure to COPCs through the ingestion of potentially impacted marine shellfish also was examined.

The future use of Nomans Land Island has been established as an unstaffed national wildlife refuge. Given this use, potential exposures and doses of COPCs would be expected for USFWS workers (performing routine activities and potentially implementing a new tern nesting program), adult and child trespassers, and special authorized visitors to the island via the same set of potential exposure routes as for the current receptors.

Step 3 – Toxicity Assessment

The possible harmful effects to humans from the COPCs were evaluated as part of the toxicity assessment. These chemicals were separated into two groups: carcinogens (i.e., COPCs that may cause cancer) and non-carcinogens (i.e., COPCs that may cause adverse health effects other than cancer). The toxicity of lead, a non-carcinogen, also was evaluated using a chemical-specific assessment approach. When appropriate, the nature of the non-cancer health effects was considered (i.e., an impact on the liver or an effect on the nervous system).

Step 4 – Risk Characterization

Lastly, the results from the exposure and toxicity assessment were combined to calculate the level of carcinogenic and non-carcinogenic risks anticipated to be associated with the projected exposure to Site COPCs (see text box describing how risk calculations are expressed). In addition, the calculated exposure point concentrations of the COPCs were compared to Applicable or Suitably Analogous Public Health Standards to evaluate the condition of “No Significant Risk.”

Based on the results of the HHRA and the comparison of the Site conditions to the limits contained in the Applicable or Suitably Analogous Public Health Standards, a condition of “No Significant Risk to Human Health” was found to exist for the island.

Ecological Risks

Stage I (screening level) and Stage II (baseline) environmental risk characterizations (ERCs) were conducted for Nomans Land Island. The ERCs consisted of the following three steps.

How is Ecological Risk Expressed?

The risk to ecological receptors is expressed as a Hazard Quotient (HQ). A receptor’s exposure estimate (e.g., amount of chemical a receptor is exposed) is compared to an effects-based benchmark for chemical uptake that is selected to be conservatively protective. When the HQ is below 1.0, toxicological effects are unlikely to occur and no significant risk is present. When the HQ is above 1.0, there is a potential for biological harm to be present.

Step 1 – Formulate the Problem

The Navy collected and evaluated information regarding the Site conditions (e.g., types of habitat and types of plant and animal species at the Site), the presence of any federal, state, or trust species of concern, the number and types of contaminants potentially present, and potential exposure pathways and mechanisms for wildlife to come into contact with these contaminants. The Navy evaluated the following ecological receptor groups: terrestrial plants and invertebrates, wetland plants and aquatic receptors (benthic invertebrates, other aquatic life and plants), and wetland and terrestrial wildlife present that are exposed to surface water (i.e., freshwater ponds), surface soil, and freshwater and marine sediment. In the FDA, the Navy evaluated wetland plants exposed to sediment; aquatic receptors (invertebrates, plants, and amphibians) exposed to surface water, sediment, and groundwater; and wetland vertebrates exposed to surface water and sediment.

The Navy also conducted a shellfish transplant and monitoring study. This shellfish study involved collecting and analyzing blue mussels from the shoreline of the island to help identify whether any contaminants were migrating off-island and into the near-shoreline marine environment. Sediment samples also were collected from various runoff channels around the island, and shellfish (blue mussels) were transplanted offshore to help aid in this part of the environmental assessment.

Step 2 – Perform Exposure and Effects Assessment

The Navy evaluated the potential exposure of a range of the relevant environmental receptors to COPCs using direct measurement of biological exposure and modeled exposure approaches. The chemical concentrations that environmental receptors would be exposed to were determined by directly sampling environmental media. Exposure modeling also included potential chemical exposure via food chain interaction, which was estimated using bioaccumulation factors (BAFs) cited from technical references and directly assessed using site-specific data. The primary exposure routes that were evaluated in the ERCs included:

- Dermal absorption and direct contact with environmental media;
- Dietary ingestion of prey;
- Surface water ingestion; and
- Incidental ingestion of environmental media.

The exposure assessment looked at individual lines of evidence using a weight of evidence approach. Each line of evidence was assigned a level of significance to assess exposure to the resource values identified as assessment endpoints in the risk assessment.

Step 3 – Characterize Risks to Environmental Receptors

The results from the exposure assessment were used in conjunction with toxicity reference values to assess the extent of potential adverse effects to the ecological receptors present on the island. In accordance with MCP and CERCLA guidance, a refinement of the conservative exposure assumptions/concentrations for evaluating the potential risks to ecological receptors (i.e., plants, invertebrates, and wildlife receptors) was performed to reduce uncertainties in highly conservative risk estimates derived during the screening-level assessment. The objective of the Stage II or baseline ecological risk assessment refinement was to determine which chemicals contribute to unacceptable levels of ecological risk, and to eliminate from further consideration those COPCs that were retained because of the use of very conservative exposure scenarios. This allowed the ERC to focus on those COPCs that are considered risk drivers for the island environment (see text box describing how ecological risk calculations are expressed).

Public Welfare Risks

Under the MCP, an assessment of the potential risks to public welfare relative to both the current and anticipated future use of the Site was required. This assessment was conducted to identify and evaluate nuisance conditions, significant community effects, and loss of active or passive property uses. A risk to public welfare exists if: (1) a nuisance condition exists or will result from the release or the threat of a release of an oil and/or hazardous material (OHM); (2) a segment of the community is affected or may reasonably be expected to be affected and experience a significant adverse impact from a release; and (3) an MCP upper concentration limit for soil or groundwater is exceeded. Based on the assessment of the Site conditions and these criteria, a determination was made that the island does not pose a risk to public welfare.

Harm to Safety Risks

An assessment of the risks of harm to safety also was required under the MCP. This assessment was conducted to determine if the release or threat of release of an OHM may pose a threat of physical harm or bodily injury to people. A risk of harm to safety is considered to exist if uncontained materials are present that exhibit the characteristics of reactivity or ignitability. The RAM performed to remove the ordnance present on the surface of the ground reduced the residual risk of harm to safety a great deal. However, the potential for exposure to the remaining subsurface ordnance posed a continuing concern relative to possible future activities on the island, and, based on this issue, a significant risk of harm to safety was determined to be present.

The initial harm to safety evaluation was followed by a second, more detailed evaluation of the risk of harm to safety that was focused on identifying effective ways for eliminating or managing the risk of harm to safety due to the residual ordnance on the island. This evaluation, the Phase IIB Supplemental Investigation – Risk of Harm to Safety, reexamined and expanded the Conceptual Site Model (CSM) for individuals who may be exposed to residual ordnance, and where and how that exposure could occur. This expanded CSM allowed a broad range of candidate response action components to be identified and evaluated. These components included: education/training and safety awareness initiatives; off-island deterrents; on-/near-island deterrents; site management procedures; supplemental characterization activity; and additional clearance activity. The results of this evaluation were carried into the Phase III/Feasibility Study analyses and used in the comparison of and recommendation for the proposed remedial response to address the remaining safety concerns presented in this Proposed Plan. As mentioned above, the Navy is following a CERCLA process, and MassDEP considers the Site to be “adequately regulated” under the MCP.

Site Background and Characteristics: Former Target Areas

Where are the Former Target Areas?

Three primary Former Target Areas, which were used for bombing practice by the military, have been identified on the island: the West End Target Area, the Aviation Landing Strip Target Area, and the Summit Target Area. **Figure 2** depicts the locations of these target areas.

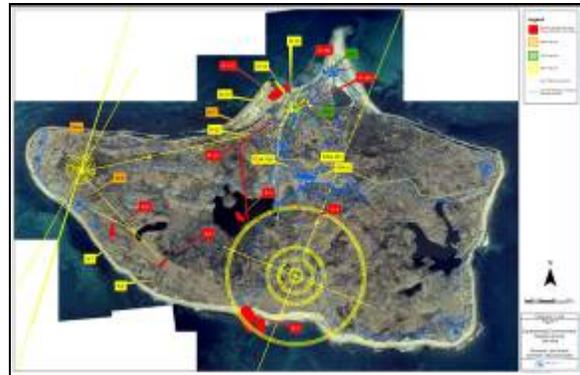


Figure 2 – Map from the SEBS showing the location of target areas and additional review items

When were the Former Target Areas Used?

Military training activities occurred from 1943 to 1996. The eastern portion of the island was maintained as an “off-limits” wildlife area where bombing activities were not authorized. The military ceased live bombing in the early 1950s. All practice bombing activities ceased in 1996.

What do the Former Target Areas Look Like Today?

Surface ordnance and target debris have been removed from all three target areas and the entire island. These areas have become naturally vegetated and continue to provide productive habitat to the wildlife. **Figure 3** shows what these target areas look like today.



Figure 3 – 2003 photograph showing the West End Target Area

What were the Investigation Results?

Investigations were directed toward the target areas as a “biased approach” that focused on the portions of the Site that exhibited the greatest impact from previous use as an aerial target range. Several rounds of environmental sampling and investigations were conducted, which are discussed in this Proposed Plan. See sidebar titled “Nomans Land Island Environmental Investigations” for an overview/timeline of the investigations. Detailed information regarding the more significant investigations is provided below.

Phase I Limited Site Investigation – 1998

In 1998, the Navy performed Phase I sampling of each target area (and of the surface water bodies and sediments, as well as at the FDA).

- **Soils** – Of the 52 samples analyzed for priority pollutant (PP) metals, 10 samples contained concentrations of six metals above the RCS-1 levels. Analyses of surface soil samples indicated non-detectable levels of explosives in 50 samples, hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX) (0.586 part per million [ppm]) in one sample, and trinitrotoluene (TNT) (3.11 ppm), octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (2.7 ppm), and RDX (19.7 ppm) in another sample. The concentration of TNT was below the RCS-1 level.
- **Groundwater** – The analyses for explosives in the groundwater samples did not detect any compounds, and approximately half of the metals results for the groundwater samples were non-detects. Most of the metals detected in the groundwater samples were below the RCGW-1 levels, with the exception of four parameters. Of the seven groundwater samples analyzed, six contained levels of zinc and three samples contained a level of nickel, thallium, or cadmium above the respective RCGW-1 level.
- **Surface Water** – Most of the analyses of surface water samples for metals and explosives were non-detect. However, RDX was detected in one sample from Rainbow Pond at 1.8 micrograms per liter. Furthermore, of the seven samples analyzed, four samples contained levels of metals above the USEPA Chronic Ambient Water Quality Criteria for fresh water.
- **Freshwater Sediment** – All of the sediment samples indicated non-detectable levels of explosives. The analyses for metals indicated various concentrations of metals were present. Lead and zinc were detected at concentrations above the RCS-1 levels: sample MP1-01 contained lead at 402 milligrams per kilogram (mg/kg) and zinc at 4,200 mg/kg.

Nomans Land Island Environmental Investigations

1986 – The Navy began evaluating environmental impacts at NAS SOWEY, including conducting Site walkovers, reviews of Base records, and interviews.

1995 – The Navy performed a Phase I EBS to identify potentially contaminated sites requiring further investigation. Nomans Land Island was one of the sites identified for further study.

1997 – The MassDEP issued a Notice of Responsibility to the Navy.

1998 – The Navy removed ordnance from the surface of the island and removed four USTs. A Phase I Limited Site Investigation was conducted to characterize Site soils, groundwater, surface water, and sediments. A radiological investigation was conducted to ensure that no recovered ordnance exhibited evidence of depleted uranium content.

1999 - 2000 – The Navy conducted a Phase II CSA to further delineate the extent of COPCs in Site soils, groundwater, surface water, and sediments. Human health and ecological risk assessments were performed.

2001 – The Navy conducted an aerial photogrammetric survey to establish an accurate basemap for the Site and to construct an extensive GIS. The Navy conducted an airborne geophysical survey to identify areas containing subsurface metal debris and to support/confirm the CSM and biased investigation approach.

2003 – The Navy conducted the SEBS, which incorporated and evaluated the airborne geophysical survey data, an aerial photographic site analysis and further public interviews and historical records review. This resulted in the removal and/or closure of 19 additional Review Items, including one UST, one septic system, and two drywells. The Navy also conducted an MEC inspection and performed removal activities in accessible upland and near-shoreline marine areas.

2004 – A Phase IIB Report, focused on the risk of harm to safety on the island due to remaining ordnance, was presented to the TRC and submitted to the MassDEP. A UXO Awareness Pamphlet was developed to educate USFWS workers conducting studies on the island.

2005 – Per a request from USFWS, the Navy prepared an Environmental Risk Characterization Memorandum to more clearly characterize the risk to the environment on the island.

2006 – The Navy implemented the Former Debris Area RAM, which involved removal of the old Quonset Hut material believed to be a source contributing to adverse impacts in the downgradient wetland.

2008 – A MEC surface clearance was performed that resulted in the removal and recycling of 394 munitions-related items and 16,119 pounds of material documented as safe (MDAS).

2014 – A limited MEC surface clearance was performed that resulted in the removal of 164 munitions-related items from 65 acres, and recycling of 3,650 pounds of MDAS.

2019 – A Phase III/Feasibility Study Report is currently being prepared to present the alternatives to address the risk of harm to safety posed by ordnance remaining on the island.

Phase II Comprehensive Site Assessment – 1999

Phase II sampling was conducted in accordance with the MCP to delineate the extent of possible contamination and to monitor the Site for a period of 12 months (on a quarterly basis). Areas where soil samples exceeded the RCS-1 during the Phase I effort were revisited, and samples were collected vertically and horizontally. The results of the follow-up sampling revealed that contamination was limited to the original sample locations (these locations were areas where craters and bomb “graves” existed). Groundwater, surface water, freshwater sediment, and marine sediment sampling were conducted. In summary:

- **Soils** – A total of 43 surface soil samples (composite and grab) were collected during the Quarter 1 event and were analyzed for PP metals, explosives, pesticides, and/or volatile petroleum hydrocarbons (VPH)/extractable petroleum hydrocarbons (EPH), as appropriate. Since the Phase II data revealed that levels of contaminants were significantly lower in both the horizontal and vertical directions from the original area of concern, soil sampling did not continue in Quarters 2, 3, and 4. No explosives were detected.
- **Groundwater** – Groundwater samples were collected during all four events. Fifteen groundwater wells, seven from Phase I and eight installed as part of the Phase II investigation, were sampled during the course of the Phase II investigation. Quarter 1 results revealed the presence of metals (arsenic, cadmium, chromium, copper, nickel, lead, antimony, selenium, thallium, and zinc). Target area samples contained each of these 10 elements, while non-target areas contained only four elements (copper, nickel, lead, and zinc). Analytical results again indicated non-detect levels of explosives in all wells, and VOCs were detected in only four wells.
- **Surface Water** – Surface water samples were collected during all four events. The Phase II surface water sampling program included collecting samples on a quarterly basis from the previous seven Phase I locations, as well as three additional locations. Target area samples confirmed the presence of copper, lead, and zinc. Samples from non-target areas contained only zinc. RDX was detected in one sample collected from Rainbow Pond.
- **Freshwater Sediment** – A total of 21 sediment samples were collected and analyzed. Although a subset of samples in each phase of sampling was analyzed for explosives, explosives parameters were detected in only three samples during Phase I. No explosives were detected in subsequent Phase II Quarters 1-4 confirmation samples.

- **Near-Shoreline Sediment** – Nine marine sediment samples were collected along the shoreline and analyzed for PP metals and acid volatile sulfide/simultaneously extracted metals (to assess bioavailability of the metals). Results indicated the presence of various levels of metals and the bio-availability of these metals.

Supplemental Environmental Baseline Survey – 2003

Additional soil and groundwater samples were collected during the SEBS event in 2003. The soils from each area of concern were sampled (as warranted). Furthermore, areas of subsurface metal debris identified during the airborne geophysical survey, which were located up-gradient of resource areas (surface water, wetland, etc.), were selected by the MassDEP for further evaluation. In addition, one UST was removed (along with petroleum-contaminated soils), and two drywells and one septic system were closed.

Analytes were detected at various concentrations, but none warranted remedial action. The metals results were incorporated into the risk assessment. The sampling results are presented in detail in the SEBS Completion Report.

Sediment samples were collected from Rainbow Pond, not subject to historical use as a target area and located proximal to the coast of the island for comparison with Ben’s Pond, located near the center of the island and within the target area. Metals concentrations were generally low to moderate, with results for cadmium, copper, lead, mercury, and zinc exceeding freshwater sediment benchmark values. No explosives were detected. Surface water samples were also collected from Rainbow Pond. Trace to low levels of metals were detected, but no explosives were detected.

Samples of groundwater, soil, and sediment (as applicable) were collected from five subsurface anomaly areas. Analyses indicated trace to low levels of metals, and no detectable levels of explosives at any locations, except at one location reporting concentrations of pentaerythritol tetranitrate and picric acid and another location where n-methyl-n-2,4,6-tetranitroaniline (tetryl) was detected.

Environmental Risk Management Memorandum

In 2004, and upon review of the Phase IIA Supplemental CSA Report and the SEBS Completion Report, the USFWS requested that a concise memorandum be prepared that would quantitatively summarize and evaluate the risks to the environment and discuss measures to address them. This memorandum provided a supplemental evaluation of areas potentially impacted by the historical activities on the island and the benefits of potential risk reduction in these areas if removal actions were to occur. This supplemental evaluation provided a more realistic

estimate of exposure by re-evaluating the no observable adverse effects level and the lowest observable adverse effects level (LOAEL) for songbirds through utilization of a mean BAF, the natural log (LN) mean BAF, and a 90th percentile BAF. These supplemental evaluations were requested by the USFWS to provide a more accurate and realistic estimation to support risk management decision-making. The Navy conducted three project management meetings with the USFWS and the MassDEP on the subject.

The final version of the memorandum, dated April 24, 2006, stated that utilization of the mean LN BAF (the BAF reached by consensus) resulted in no LOAEL-based exceedances for cadmium, chromium, lead, or zinc on an island-wide basis for the songbird. Upon discussion of these results between the Navy, USFWS, and MassDEP, it was concluded that a level of no significant risk to environmental receptors associated with the soil/invertebrate pathway related to the target areas had been achieved. Furthermore, it was concluded that remedial action should be performed at the FDA in order to remove the source material identified in the FDA slope.

Former Target Areas Conclusions

The risk assessments conducted during the Phase I and Phase II assessments have revealed that the soils, surface water, sediment, and groundwater at the Site pose no significant risk to human health and public welfare. Based on the information contained in the environmental risk assessments, the USFWS and MassDEP have determined that a level of “no significant risk” to the environment has been achieved at the Site.

Ordnance remains in the subsurface soils at the Site and in the near-shoreline marine environment. The island is managed as an unstaffed national wildlife refuge, and, while it is off-limits to the public, is susceptible to trespassers. As such, a level of “no significant risk” to safety has not been achieved.

The Navy proposes to implement Remedial Alternative S-2 (described in the Phase III/FS Report), which consists of “Institutional Controls/Public Awareness and Enforcement”. This Proposed Plan would formally put in place a system of institutional controls (e.g., signage, Activity Use Limitation (AUL), inspections, UXO response), which will aid in keeping potential trespassers off of the island, thus reducing the potential for people to come into contact with ordnance-related materials. Similar controls and inspections have already been implemented as interim measures to mitigate risks and ensure safety during the planning process. As part of this plan, the USFWS will continue to maintain the access restrictions and enforcement actions applicable to the national wildlife refuge. The implementation of this remedial alternative would ensure that a level of “no significant risk” to safety

can be achieved at the Site by reducing receptor exposure to potential explosive hazards remaining on the island.

Site Background and Characteristics: Former Debris Area

Where is the Former Debris Area?

The FDA is located just north of the highest point on the island (**Figure 4**). It is located upgradient of an extensive emergent wetland that runs west to east and eventually drains into the ocean in the eastern portion of the Site.

Former Debris Area Use

During the Phase I Limited Site Investigation, the Navy identified this location as having the characteristics of a “debris area.” Metal debris, particle board, ceramics, etc. were observed to be protruding from the surface soils along the hillside located down-slope from numerous concrete foundations. Soil, groundwater, surface water, and sediment sampling were conducted as part of the Phase I and II investigations. In 2001, a test pitting program confirmed that subsurface debris was present. The aerial photograph analysis of the area (conducted as part of the SEBS) provided conclusive evidence that the origin of the debris was the former Quonset huts that had been demolished and disposed in this location sometime between 1951 and 1957. The Quonset huts had occupied the area where concrete pads currently exist (**Figure 4**).

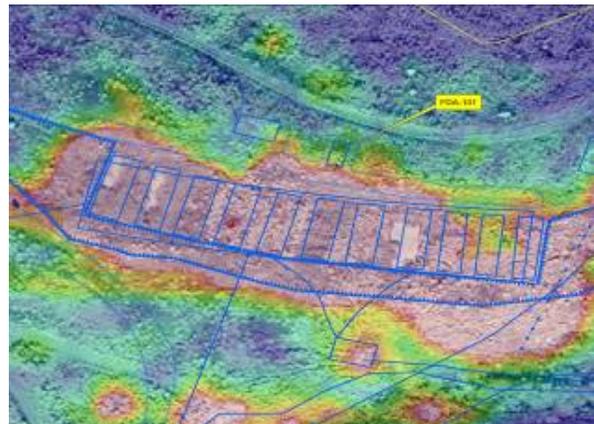


Figure 4 – Former Debris Area showing location of old Quonset huts

What does the Former Debris Area Look Like Today?

In 2003, the Navy implemented a RAM to close a septic system along the slope of the FDA. In 2006, another RAM was implemented to remove the metal debris that had the potential to act as a “source” of potential contamination to the downgradient wetland resource. **Figure 5** shows the FDA wetland.



Figure 5 – Former Debris Area and wetland

What were the Investigation Results?

Environmental investigations at the FDA were conducted as part of the Phase I, II, IIA, and SEBS investigation activities (see sidebar titled “Nomans Land Island Environmental Investigations” for a timeline of investigations). An overview of the actions performed and analytical results from the environmental investigations is provided below.

FDA Phase I Sampling

The FDA was discovered during the Phase I Limited Site Investigation. Soil, groundwater, surface water, and sediment in the area were sampled for a full range of analytes, including PP metals, pesticides, VOCs, semi-volatile organic compounds, VPH, EPH, and explosives. The results are summarized below.

- **Soils** – Three samples were analyzed for metals, explosives, VOCs, polychlorinated biphenyls, VPH/EPH, and pesticides. No samples exceeded the RCS-1 for metals. No explosives were detected. Low levels of VPH, EPH, VOCs, and pesticides were detected all at concentrations below the RCS-1 criteria.
- **Groundwater** – One well was sampled. Zinc levels exceeded the RCGW-1 criteria.
- **Surface Water** – One sample was collected. An elevated level of zinc was detected.
- **Freshwater Sediment** – One sample was collected. No explosives were detected. Elevated levels of lead and zinc were detected at MP1-01.

FDA Phase II Sampling

Soil, groundwater, sediment, and surface water were sampled at the FDA as part of the quarterly monitoring. The results are summarized below.

- **Soil** – Three sample locations from the Phase I activities were revisited and samples were collected and analyzed for VPH/EPH and pesticides. EPH was detected; VPH and pesticides were not detected.
- **Freshwater Sediment** – Samples of simultaneously extracted metals/acid volatile sulfides were collected. Results indicated that metals were bio-available.
- **Groundwater** – Copper, nickel, lead, chromium, beryllium, and zinc were detected. Explosives were not detected.
- **Surface Water** – During Quarter 1, the surface water was too dry to sample. Copper was detected in Quarters 2 and 3. Lead was detected in Quarters 3 and 4. Zinc was detected in Quarters 2, 3, and 4. Chromium, nickel, and beryllium were also detected.

FDA Phase IIA Sampling

In 2001, an extensive sampling effort at the FDA was conducted to further characterize the FDA and to determine the health of the FDA wetland. Surface and subsurface soil and sediment samples were collected from a 50-foot grid established throughout the wetland. Samples were analyzed for PP metals, and benthic and toxicity testing was performed. A reference area was also sampled for comparison purposes. The results are summarized below.

- **Soils** – Copper, lead, and zinc were detected in soils along slope, with arsenic, chromium, and nickel detected in fewer samples. Tetryl was detected in one sample.
- **Freshwater Sediment** – All PP metals were found at a single location in the wetlands (MP1-01), with exceedances of the probable effects concentrations found. Tetryl was detected in four samples.

FDA Phase SEBS Septic System RAM

In 2003, the Navy closed out the septic system that had serviced the former Quonset huts located along the slope of the FDA. It was found that the septic tank had been removed previously. Samples were collected from the bottom of the tank location and the discharge pipes. No contamination was identified.

FDA Removal RAM

In 2006, the Navy removed the metal debris located in subsurface soils along the slope of the FDA. This debris originated from the disposal of the old Quonset huts and was believed to contribute to the elevated levels of metals in soils at the toe of the FDA wetland. All excavated soil was sifted through a mechanical screener and sampled for cadmium, chromium, lead, and zinc. The analytical results were discussed with the MassDEP and the USFWS and the screened soils were backfilled on site. Metal debris from

one area containing elevated concentrations of metals (MP1-01) was removed during this field effort. This location, which exhibited the highest concentrations of zinc, was on the direct pathway from the potential source material to the wetland sediment that was shown to exceed multiple benthic community endpoints.

Former Debris Area Conclusions

Prior to implementation of the FDA removal effort in 2006, the USFWS and the MassDEP had indicated that a level of no significant risk had been established for the environment in regard to the Site soils. However, the subsurface debris at the FDA required removal since this material was providing a continuing source of metals contamination to the adjacent wetland. Since this removal effort is now complete, a level of no significant risk to the environment has been achieved at the FDA.

Site Background and Characteristics: Near-Shoreline Marine Environment

Where is the Near-Shoreline Marine Environment?

The near-shoreline marine environment includes the immediate marine waters and sediments surrounding the island.

What was the Near-Shoreline Marine Environment used for?

The near-shoreline marine environment around the island was not a target area but is considered part of the Site due to the possibility that not all ordnance items landed on their respective targets, but may have landed in the waters surrounding the island. This has been confirmed by MEC that has been observed in the waters directly offshore.

What does the Near-Shoreline Marine Environment Look Like Today?

The near-shoreline area looks very similar to the shoreline of Martha's Vineyard (see **Figure 6**), with steep cliffs on the southern shoreline and sandy beaches along the northern shore of the island. Occasionally, MEC, deposited from the eroding banks or as the result of being washed onshore from the ocean during storm events, has been observed on the shoreline.



Figure 6 – Nomans Land Island shoreline showing signage

What were the Investigation Results?

Near-Shoreline Sediment Sampling

As part of the Phase IIA investigation in 2001, sediment samples were collected from seven runoff channels and seven near-shoreline locations to evaluate the potential of migration of COPCs off the island. Metals concentration results were relatively low, and no explosives were detected. It was concluded that a potential pathway (i.e., surface water runoff) did exist for the West End Target area.

Shellfish Sampling

A shellfish sampling study was conducted as part of the 2001 Phase IIA Investigation. Native blue mussels were harvested from three areas along the shoreline to assess potential exposure for comparison with representative reference levels. Metals levels in the blue mussels exceeded National Oceanic and Atmospheric Administration (NOAA) National Status and Trends Program database levels for Massachusetts waters, but were generally comparable to metals concentrations found in blue mussels harvested from Martha's Vineyard, Massachusetts marine waters.

Shellfish Transplant Study

The objective of the 2001 Phase IIA Investigation transplant study was to support the assessment of off-site COPC migration and the potential for leaching of ordnance in the marine environment. Seven racks were deployed, along with one reference station near Menemsha Harbor. Only four racks were recovered (three from the island and one from a reference location). No statistical difference in metals concentrations was detected from transplanted shellfish as compared to the reference station. **Figure 7** shows the shellfish transplant study locations.



**Figure 7 – Shellfish transplant locations
Near-Shoreline Marine Environment Conclusions**

Results of the near-shoreline sediment sampling, shellfish monitoring, and shellfish transplant study revealed variations in metals concentrations in indigenous and transplanted blue mussels, which overlapped concentrations from other local marine waters. The conservative nature of the exposure assessment and risk characterization and the associated uncertainty resulted in a finding of “no significant risk” to the environment.

A level of “no significant risk” has not been established for safety due to a concern that ordnance may be present in this near-shoreline environment. Therefore, the Navy proposes to implement Institutional Controls / Public Awareness and Enforcement program, and to maintain the restrictions and enforcement program currently in use by the USFWS. These measures will help limit receptor exposure to potential explosives hazards in the near-shoreline areas.

Site Risks: Risk of Harm to Safety

The Phase IIB Report, dated April 25, 2006, addresses ordnance safety on/adjacent to the island, in accordance with the DoD and USEPA document titled “Unexploded Ordnance Management Principles for Closed, Transferring, and Transferred Ranges”, dated March 7, 2000 (USEPA 2000). This includes authority granted to DoD relative to ordnance safety and CERCLA. The Phase IIB analysis was performed to further consider the risk of harm to safety posed by ordnance and munitions items at the Site.

Ordnance remains in the soil and in the near-shoreline marine environment surrounding the island. A geophysical survey conducted on the island indicated that the distribution of subsurface metal debris appears consistent with the target areas. Site soils and vegetation act as a barrier for potential receptors, preventing direct contact with potential ordnance. However, through natural processes, such as erosion and frost heaving of soils, ordnance items have the potential to migrate and become

exposed. **Figure 8** depicts an example of ordnance used on the island.



Figure 8 – Example of ordnance used on the island

The amount and type of ordnance in the near-shoreline environment is unknown. The water acts as a barrier for receptors, preventing direct contact with potential ordnance lying on the bottom or within the underlying sediment. However, activities such as fishing, shellfishing, lobstering, diving, etc. create the potential for people to encounter ordnance.

Site Controls and Restrictions Currently being Implemented

The Navy has addressed the risk of harm to safety on the island since the initial bombing operations commenced sometime around 1943. Throughout this period, and continuing to the present day, the island and the surrounding waters remain a designated Danger Area and a Restricted Area the area is marked by signage accordingly. No access is authorized in this area without proper government approvals. The controls currently in place are discussed below.

Institutional Controls

Danger and Restriction signs have been placed and maintained on the northern, western, eastern, and southern shorelines of the island. These signs are clearly visible to the operator of a vessel should that vessel enter into these restricted waters. **Figure 9** shows a sign that is currently in place and maintained on the island.



Figure 9 – Restriction signage on Nomans Land Island

Public Awareness

The Navy has developed a UXO Awareness Pamphlet specifically designed to present the UXO hazards on the island. This pamphlet is aimed at the USFWS workers performing services on the island and details what to look out for, what to do if they encounter UXO, and who to contact if an item is found.

The Navy has utilized the TRC process, established for the remedial program on the Site, to keep public officials and the general public aware of the hazards that still exist on the island due to the potential for UXO to be present. Three information repositories have been established on Martha's Vineyard that are open to the public and present materials relating to UXO safety concerns. Public meetings have been held specifically on the subject of UXO safety. Members of the local community, such as town selectman and tribal representatives, are on the TRC, and local officials, such as the Fire Chief, Police Chief, and the Harbormaster, have attended these meetings and have been involved with the remedial process.

Restrictions

The island and the surrounding waters are clearly depicted as a Danger Area and Restricted Area on NOAA nautical charts (see **Figure 10**). Individuals operating vessels transiting the area who may be unfamiliar with the waters (and unaware of the potential UXO dangers) would most likely be using these charts to safely navigate their vessels.

Enforcement

The USFWS typically conducts between one and four field events yearly on the island. The USFWS has the power to issue citations should someone be trespassing. Since the beginning of the remedial program in 1997, evidence of trespassing has been limited.

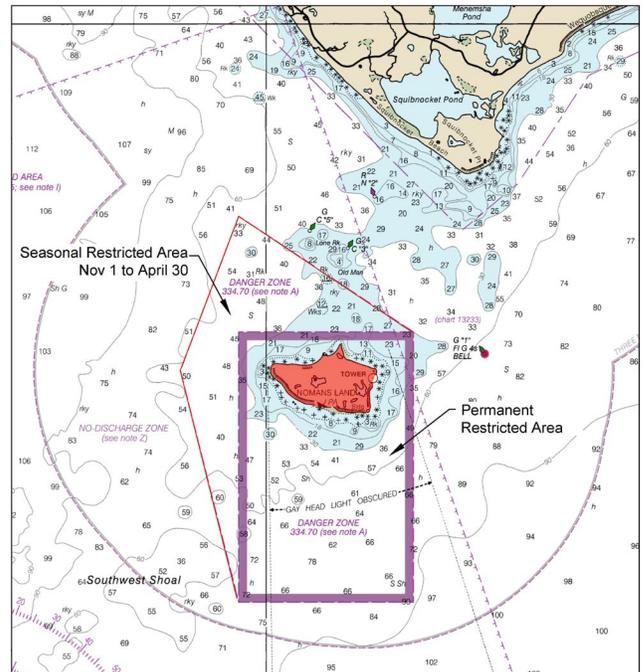


Figure 10 – Danger Zone/Restricted Area of Nomans Land Island

MEC Clearances Performed to Reduce Site Risk

MEC surface clearances were conducted on the island in 1998, 2003, 2008 and 2014 for the overall purpose of reducing the risk of exposure to MEC to USFWS personnel, authorized visitors, and potential trespassers accessing the island. The objective of the MEC surface clearance was to systematically locate, inspect, destroy, and remove all MEC, material potentially posing an explosive hazard, and other debris located on the surface of or protruding from the surface of the island. Based on the current and foreseeable use of the Site as an unstaffed national wildlife refuge, a surface clearance was performed. While this level of clearance is appropriate for the designated use of the Site, a condition of “Risk of Harm to Safety” (as described in 310 *Code of Massachusetts Regulations* 40.0900) remains due to the presence of MEC.

During the summer of 1998, approximately 671,306 pounds of ordnance debris and 59,847 pounds of scrap were removed from the island surface as part of a MassDEP approved RAM. Results from the associated Limited Phase I Site Assessment performed in 1998 were previously summarized.

The limited MEC surface clearance of assessable areas conducted during the summer of 2003 consisted of a site reconnaissance and MEC assessment, demolition, and removal effort. Accessible coastline, roads, and three interior grids were included in this effort. Approximately 63 MEC items were observed and removed from along the

shoreline. Two MEC items were discovered upland and removed, one along a road which appeared to be relocated due to surface runoff; the other was incidental to environmental investigations.

In 2008, a MEC clearance occurred after a controlled burn of vegetation was conducted that exposed surface material. The land area included in this project consisted of the western portion of the island (not including the eastern historical USFWS refuge).

In 2014, a limited MEC clearance occurred after vegetation was cleared, using a mower, along the accessible roadway. MEC was cleared along the island roadways and the beachfront perimeter of the island.

Navy Explosive Ordnance Disposal (EOD) personnel from Naval Station Newport have also conducted periodic limited responses to surface MEC on the island.

The Remedial Action Objectives

As previously summarized, the environmental program for the Site has involved conducting various investigation, assessment, and remedial activities to address the risk of harm to safety. The following remedial action objectives (RAOs) focus on reducing the risk of harm to safety for the island:

- Reduce receptor exposure to surface MEC
- Reduce receptor exposure to subsurface MEC
- Reduce receptor exposure to near-shoreline/offshore MEC
- Achieve a permanent solution, with conditions, using the selected remedial action alternative

These RAOs work to establish a “Permanent Solutions with Conditions” to address safety for the island due to MEC. A Permanent Solution with Conditions maintains a level of “No Significant Risk”, in part by relying on a Notice of AUL and/or on assumptions about future conditions of the Site.

Summary of Remedial Action Alternatives

Three remedial action alternatives to address Risk of Harm to Safety, identified below, were identified in the feasibility study conducted for the Site:

1. **Alternative S-1, Source Removal**
 - *Terrestrial – Subsurface MEC Removal*
 - *Marine – Underwater UXO Clearance*
 - *Estimated Cost – \$31,000,000*

Alternative S-1 reduces receptor exposure to MEC, both in upland soils and near-shoreline/offshore marine sediments, by removing the source material (applicable to upland removal) such that there is no likelihood of receptor contact with UXO. This alternative provides the highest level of effectiveness in reducing receptor exposure to MEC on the Site by removing MEC in the terrestrial environment and removing the UXO hazard in the marine environment. Land use controls (LUCs) and operations and maintenance (O&M) activities would still be necessary for this alternative (including sign replacement/maintenance and limited MEC surface clearances).

2. **Alternative S-2, Institutional Controls/Public Awareness and Enforcement**

- *Terrestrial – Institutional Controls/Public Awareness and Enforcement*
- *Marine – Institutional Controls/Public Awareness and Enforcement*
- *Estimated Cost – \$11,000,000*

Alternative S-2 involves the design and implementation of an extensive institutional controls and O&M program to reduce receptor exposure to MEC potentially remaining in Site soils and potential UXO remaining in the near-shoreline/marine sediments. This alternative would impede receptor exposure by producing numerous deterrents to inhibit people’s contact with MEC.

3. **Alternative S-3, No Action**

- *Terrestrial – No Action*
- *Marine – No Action*
- *Estimated Cost – \$ 0 (relative)*

Alternative S-3 is provided as a baseline for Alternatives S-1 and S-2. No administrative, process, remediation, or closure activities would be performed for either the terrestrial or marine portions of the Site. All Site closure activities would cease, and no further funding would be applied to the Site.

Evaluation of Remedial Action Alternatives

The Remedial Action Alternatives S-1 and S-2, selected to address the Risk of Harm to Safety, were compared using the evaluation criteria listed in the box below. The alternatives listed above were screened using CERCLA, MCP, and Navy criteria. Alternative S-3, No Action, was initially screened and removed as it did not adequately address the RAOs for the risk of harm to safety considerations of the Site. A complete discussion of the evaluation of remedial alternatives can be found in the Phase III/Feasibility Study Report.

Both Alternatives S-1 and S-2 would meet the CERCLA threshold criteria of (1) overall protection of human health and the environment, and (2) compliance with ARARs/TBC.

Both Alternatives S-1 and S-2 would meet the CERCLA balancing criteria of (3) long-term effectiveness and permanence, (4) short-term effectiveness, and (5) implementability. Alternative S-1 would reduce risk by removing MEC, whereas Alternative S-2 would reduce risk by requiring legal and regulatory controls to limit access to the island. Only Alternative S-1 would address the CERCLA balancing criteria of reduction in toxicity, mobility and volume with MEC removal. The CERCLA balancing factor of cost for Alternative S-1 would be much greater than Alternative S-2.

Both Alternatives S-1 and S-2 would meet the MCP-specific criteria of (1) risk of alternative and (2) comparative benefits. The MCP criterion of (3) comparative timeline for both alternatives would be 30 years to provide for long-term site maintenance, LUCs, and limited MEC surface clearances. The MCP criterion of (4) relative effect upon non-pecuniary interests for Alternative S-2 is minimal, whereas, for Alternative S-1, it would require temporary, short-term detonation of donor explosives to neutralize potential MEC.

Both Alternative S-1 and S-2 would meet the Navy specific criteria of performance objectives that measure the operational efficiency and suitability of a particular remedial technology. However, the Navy criteria for optimization and exit strategy, a means of determining when it is time to stop, modify, or change a particular technology based on the achievement of previously established performance objectives, would be determined as an ongoing process during implementation.

If Alternative S-1 was implemented, a significant loss of habitat and wildlife would occur. In addition, if Alternative S-1 was implemented, there would still be residual risk at completion of MEC removal, given the likelihood that an unknown number of MEC items could potentially be missed.

Alternative S-1 would provide an appropriately selected remedy should future use of the Site change (e.g., construction of residences, recreational use by the general public, public site visits). However, given that the current and future use of the island remains that of an unstaffed national wildlife refuge, the risks associated with the MEC hazards that remain on the island can be managed such that potential receptor exposure to potentially explosive hazards is reduced to acceptable levels using institutional controls. The current upland controls that aid in limiting receptor (trespassing) exposure on the terrestrial portion of the Site have been shown to be relatively effective deterrents, Trespassing is known to occur on a limited basis. These controls need to be further refined and

formally enacted, along with a public awareness and enforcement program. Applied to the marine portion of the Site, these programs would also provide an acceptable level of reduction in receptor exposure to MEC in the surrounding waters. Therefore, Alternative S-2 was selected as the proposed remedy to address the risk of harm to safety, given that the current and future use of the Site remains an unstaffed national wildlife refuge.

The Proposed Plan for the Preferred Remedial Alternative

The preferred remedial alternative, S-2, Institutional Controls / Public Awareness and Enforcement, will meet the RAOs by achieving a permanent solution with conditions to address safety for the island due to MEC. Remedial Alternative S-2 was selected to address the risk of harm to safety, since the current and future use of the Site will remain an unstaffed national wildlife refuge. The Navy, USFWS, and the MassDEP concur with the selection of this remedy. However, the preferred alternative, discussed below, can change in response to public comment or new information.

The environmental cleanup of chemical contamination of the island has been completed. During the earlier phased investigations, Site access restrictions were implemented and USFWS workers and the public were educated on the remaining safety concerns due to the presence of MEC. The USFWS has been implementing a safety program that was proposed by the Navy. Through discussion between the MassDEP, USFWS, and the Navy, and as part of the implementation, the selected remedial alternative includes the safety program for the Site, which consists of institutional controls, public awareness, and enforcement components. These components will be formalized with an O&M Plan, LUC Implementation Plan, and a Notice of AUL.

The Proposed Plan for the selected Remedial Alternative, S-2, includes the following components:

Institutional Controls

- Restricted Water Designation
- Signage
 - Upland signage replacement/maintenance
 - Beach signage
- USFWS O&M Plan
 - Inspections
- Navy O&M (e.g., limited MEC surface clearances, UXO response)
- UXO response program

Evaluation Criteria for Remedial Alternatives

CERCLA requires that remedial action alternatives be evaluated, using nine criteria, to identify the “Preferred Alternative”. For this Site, three additional MCP-specific criteria and two additional Navy-specific criteria were applied in the selection of the Preferred Alternative. The criteria are summarized below.

CERCLA Criteria:

All potential remedial action alternatives must meet the following threshold criteria:

- (1) Overall protection of human health and the environment
- (2) Compliance with applicable or relevant and appropriate requirements (ARARs)/to-be-considered (TBC)

The following primary balancing criteria distinguish and measure differences between alternatives:

- (1) Long-term effectiveness and permanence
- (2) Short-term effectiveness
- (3) Implementability
- (4) Reduction in toxicity, mobility, and volume
- (5) Cost

The following modifying criteria are those that are fully evaluated after public comment on the Proposed Plan and include:

- (1) Acceptance by appropriate state agencies or agencies with jurisdiction over affected resources
- (2) Community acceptance

Additional MCP-Specific Criteria:

- (1) Risk of alternative
- (2) Comparative benefits
- (3) Comparative timeline
- (4) Relative effect upon non-pecuniary interests

Additional Navy-Specific Criteria:

- (1) Performance objectives
- (2) Optimization and exit strategy

- LUCs - restricted assess
- Annual Verification

Public Awareness

- USFWS/public UXO awareness training
- UXO awareness pamphlet

Enforcement

- USFWS violations/fine system
- U.S. Coast Guard/Marine Police violations/fine system

These components have already been in use by the Navy and USFWS and will continue to reduce the level of receptor exposure to potential UXO on the Site.

An O&M Plan was drafted for the USFWS in 2001, finalized and implemented in 2004, and revised in 2019. This plan was prepared to ensure that the institutional controls already in place (i.e., signs and restrictions) were adequately maintained and to provide feedback on MEC that had potentially come to the surface due to natural processes. The USFWS has incorporated this plan into its site visit and fieldwork schedule. As a result, the signs and restrictions have been maintained and only a limited amount of trespassing has occurred.

The preferred remedial alternative, S-2, meets the threshold criteria and provides the best balance of tradeoffs among the alternatives with respect to the balancing and modifying criteria. The preferred remedial alternative satisfies the following statutory requirements of CERCLA §121(b): (1) be protective of human health and the environment; (2) comply with ARARs (or justify a waiver); (3) be cost-effective; (4) utilize a permanent solution with conditions to the maximum extent practicable; and (5) satisfy the objective to establish a level of no significant risk using a combination of institutional controls, public awareness, and enforcement.

Rationale for the Proposed Plan of Institutional Controls/Public Awareness and Enforcement

The Phase III/Feasibility Study examined a range of alternatives and was designed to address the only remaining risk identified for the island, the risk of harm to safety associated with the remaining subsurface ordnance in the soil and nearshore environment. Different possible responses were considered and evaluated. The selected Remedial Alternative of **Institutional Controls/Public Awareness and Enforcement** was judged to be the best option for meeting the safety-related remedial goals. The Navy has concluded that the selection of this alternative,

detailed within the Phase III/FS Report, is appropriate for the reasons outlined below.

- Phase I, II, IIA, and SEBS chemical sampling results for soil, groundwater, sediments, and surface waters at the Site demonstrated that exposures to these media do not pose a significant risk to human health, public welfare, and the environment. This finding was mutually agreed upon by the Navy, the USFWS, and MassDEP, and was summarized in the Environmental Risk Management Memorandum.
- All known sources of potential OHM contaminants (with the exception of subsurface ordnance) have been removed from the island or remediated to eliminate or mitigate their potential impact on people or the environment.
- The current and foreseeable future use remains that of an unstaffed national wildlife refuge. Public access is not permitted.
- The components of this proposed response alternative have been selected to specifically address the site-specific safety concerns.
- The proposed response reflects a multiple initiative approach, including elements of additional site access controls and use prohibitions, education about site conditions and safety, and enforcement measures.
- Implementation of this Proposed Plan will effectively reduce people's exposure to potential explosive hazards associated with the ordnance present on the island.

Next Steps – Community Participation

The next step in the CERCLA processes for the Site is to review and consider this Proposed Plan for acceptance by the community. The Navy encourages the public to review this Plan and to submit comments. During the public comment period from September 15, 2020 to October 15, 2020, the Navy will accept written comments on the Proposed Plan. The Navy will accept verbal comments during a public hearing that follows a public information meeting to be held on September 29, 2020 via webinar.

Following the public comment period on this Proposed Plan, the Navy will summarize and respond to comments received during that period and during the virtual public hearing in a document called a Responsiveness Summary. The Navy, the USFWS, and MassDEP will carefully consider all comments received.

Once the communities have commented on this Proposed Plan, the Navy will consider all comments received. It is possible that public comments can change this Proposed Plan. The Navy is required by law to provide written responses to comments received on this Proposed Plan.

Ultimately, the final plan will be documented in a Record of Decision (ROD). The Responsiveness Summary will be issued as a section of the ROD. The ROD will contain the rationale for the Navy's decision regarding the selected alternative. The Navy and MassDEP will review all comments and they will be included in the final ROD. The document will then be made available to the public at the information repositories listed at the end of this document. Also, the Navy will announce the availability of the ROD through the local news media and the community mailing list.

Your Questions and Comments are Important



Formal comments are used to improve the decision-making process. The Navy will accept formal comments from the public during a 30-day comment period and will hold a public information meeting and hearing for both written and verbal comments (see page 1 for information regarding how to submit a formal comment to the Navy). Your formal comments during this time will become part of the official record for Nomans Land Island. The Navy will consider the comments received during the comment period prior to making the final decisions for the Site. The public is encouraged to participate during this period as your thoughts and opinions will help in making the final decision. You do not have to be a technical expert to take part in the process.

If the institutional controls, public awareness, and enforcement alternative in this Proposed Plan is approved, all environmental investigations and activities for the Site will be considered complete following signature of the ROD, and the island will continue to be managed by the USFWS accordingly.

Commitment to the Communities

The Navy is committed to keeping the communities informed regarding the environmental cleanup programs at the Site. Public meetings have been held to provide community feedback. The TRC, comprised of community leaders, government agency representatives, and local citizens, was formed to discuss the environmental programs for the island.

The Navy also maintains a community mailing list for distributing information about the environmental programs. If you would like to be added to the mailing

list, please contact Mr. David Barney at the address provided in this Proposed Plan.

Details of the information summarized in this Proposed Plan are contained in the documents below, which are available for your review at the information repositories listed at this end of this document.

Important Dates and Meeting Information

Public Comment Period:
September 15, 2020 through October 15, 2020

Virtual Public Information Meeting and Public Hearing:
September 29, 2020
Public Information Meeting at 7 p.m.
Public Hearing at 8 p.m.

The Virtual Public Information Meeting and Public Hearing will be presented as a WebEx Webinar.

To participate in the Webinar, type into your browser this shortened link:

<https://tinyurl.com/NMLPPWE5>

or this full link:

<https://tetrattech-events.webex.com/tetrattech-events/onstage/g.php?MTID=ee31dd9f0b3b991b6ddbdc5197a58fc0a>

Then enter your name and email address and click the “Join Now” button.

If you are unable to join the meeting online, you may join by phone by calling +1-408-418-9388 and entering the Access code: 132 470 7236#.

A WebEx Webinar Information and Tips instruction sheet for accessing and participating in the meeting is available from the repositories and BRAC website.

If you experience technical difficulties accessing the meeting, please contact WebEx by telephone at 1-866-779-3239.

Document Type	Document Name	Conclusion/Result
Investigation/ Assessment	Explosives Safety Remediation Plan (ESRP) – 1997	<ul style="list-style-type: none"> Established objectives and work approach to perform UXO surface clearance approved by the DoD Explosives Safety Board.
	Phase I Limited Site Investigation – 1998	<ul style="list-style-type: none"> Addressed nine review items from the EBS. Metals detected in Site soils, groundwater, surface water, and sediment. Explosives were detected in two soils samples and one surface water sample.
	Radiological Screening Survey Report – 1998	<ul style="list-style-type: none"> Confirmed that ordnance debris tested negative for radiological constituents.
	Phase II Comprehensive Site Assessment – 1999/2000	<ul style="list-style-type: none"> Metals in soils determined to be localized to bomb craters/graves. No explosives detected in soils, sediment, and groundwater. RDX detected in one surface water body.
	Phase IIA Comprehensive Site Assessment – Supplemental Investigation – 2001	<ul style="list-style-type: none"> Elevated levels of metals detected in the FDA. FDA wetland sediments found to exceed multiple benthic community endpoints. Identified potential pathway from Site soils to marine environment.
	Interview Summary Letter Report – 2002	<ul style="list-style-type: none"> Generally confirmed what was already known regarding Site history and use.
	Airborne Geophysical Survey – 2001/2002	<ul style="list-style-type: none"> Areas of subsurface metal identified. Data supports the CSM and biased sampling approach.
	Aerial Photographic Site Analysis – 2001	<ul style="list-style-type: none"> Filled data gaps regarding historical use. Confirmed the CSM.
	Supplemental Environmental Baseline Survey – 2003	<ul style="list-style-type: none"> Identified 19 additional review items. Inspected, assessed, and sampled these review items under MassDEP oversight.
	Phase IIB – Supplemental Investigation - Risk to Safety – 2004	<ul style="list-style-type: none"> Expanded the explosive hazards CSM and evaluated ordnance risk of harm to safety.
	Environmental Risk Management Memorandum – 2006	<ul style="list-style-type: none"> Determined a level of “no significant risk” to environment was achieved for Site soils. Recommended removal of metal debris from the FDA.
	Final Phase III/Feasibility Study – 2019	<ul style="list-style-type: none"> Recommended that Alternative S-2 Institutional Controls, Public Awareness, and Enforcement be selected as the preferred plan.
RAMs	Ordnance Debris Removal RAM – 1998	<ul style="list-style-type: none"> Removed over 11,000 ordnance-related items (671,306 pounds) and 59,847 pounds of scrap from the island.
	UST Removal RAM – 1998	<ul style="list-style-type: none"> Four USTs (and associated piping) removed. Twenty-five cubic yards of petroleum-contaminated soils removed.
	Removal of One UST, Two Drywells, and One Septic System RAM – 2003	<ul style="list-style-type: none"> Removed one 275-gallon UST and 19 cubic yards of contaminated soil. Two drywells and one septic system were closed in place.
	FDA Removal RAM – 2006	<ul style="list-style-type: none"> A total of 1.5 tons of metal debris removed. Performed field soil screening at Aviation Landing Strip Areas.
MEC Clearance	After-Action Report – August 2004	<ul style="list-style-type: none"> Summarized the 1998 MEC surface clearance operations and the 2003 limited MEC surface clearance of assessable areas. Confirmed completion of the ESRP objectives.
	MEC Surface Clearance – 2008	<ul style="list-style-type: none"> A total of 16,119 pounds MDAS removed and recycled. A total of 394 munitions-related items disposed off-site.
	Limited MEC Surface Clearance – 2014	<ul style="list-style-type: none"> A total of 65 acres cleared of 164 munitions-related items. A total of 3,650 pounds of MDAS removed and recycled.
Background Documents	Final Report, Phase I Environmental Baseline Survey, November 1996	<ul style="list-style-type: none"> Identified review item areas for further study.

GLOSSARY OF TERMS

Activity and Use Limitation – A grant of environmental restriction or notice of activity and use limitation recorded, registered, or filed.

Background Level – Chemicals or concentrations of chemicals present in the environment due to naturally occurring geochemical processes and sources, or to human activities not related to specific point sources or source releases.

Benchmark – A concentration of a chemical considered to be protective of human health or the environment.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) – A federal law passed in 1980 and amended in 1986 by the Superfund Amendments and Reauthorization Act (SARA). These laws created a system and funding mechanism for investigating and cleaning up abandoned and/or uncontrolled hazardous waste sites. The Navy's cleanup of sites regulated by CERCLA/SARA is funded by the United States Department of Defense under the Defense Environmental Restoration Fund.

Environmental Baseline Survey – An environmental assessment conducted by the Navy at bases that have been closed under the Base Realignment and Closure (BRAC) Act.

Institutional Controls – Non-engineering measures, such as administrative and/or legal controls, that help to minimize the potential for human exposure to contamination and/or to protect the integrity of a remedy by limiting land or resource use.

Munitions and Explosives of Concern (MEC) – Military munitions that pose an explosive safety risk and include both fired military munitions (UXO) and unfired military munitions.

Ordnance – Bullets, bombs, grenades, blasting caps, shells, and fuzes.

Proposed Plan – A CERCLA document that summarizes the Navy's preferred cleanup remedy for a site and provides the public with information on how they can participate in the remedy selection process.

Responsiveness Summary – A document containing the responses to the formal comments submitted by the public regarding the Proposed Plan. This summary is issued as a section of the Record of Decision (ROD).

Review Item – Areas of concern generated from the Environmental Baseline Survey. These areas require removal actions and/or investigations/assessments to address site concerns.

Streamlined Risk Assessment – An ecological or human health risk assessment using a limited number of conservative exposure pathways, receptors, and exposure assumptions agreed upon in advance with the regulatory agencies. Results indicating acceptable risk under the most conservative approach (for example, the residential scenario) would therefore indicate acceptable risk under all other scenarios.

Unexploded Ordnance (UXO) – Objects resulting from the military's use of munitions in training. Specifically, ordnance that was fired but did not explode.

For More Information...

Contacts

If you have questions or comments about this Proposed Plan, or any other questions about Nomans Land Island, please contact us.

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Information Repositories *(Hours are subject to change.)*

Documents relating to environmental cleanup and restoration activities for the Nomans Land Island, including the Phase III/Feasibility Study, PRAP Webinar Presentation, additional Webinar access instructions, and this PRAP, are available for public review at the following information repositories:

Chilmark Town Hall
c/o Timothy Carroll, Town Administrator
401 Middle Road
Chilmark, MA 02535
(508) 645-2100
townadministrator@chilmarkma.gov
Monday-Friday: 9:00 – 5:00; Saturday, Sunday: Closed

Aquinnah Township Hall
c/o Jeffrey Madison, Town Administrator
65 State Road
Aquinnah, MA 02535
(508) 645-2300
townadministrator@aquinnah-ma.gov
Monday-Friday: 9:00 – 5:00; Saturday, Sunday: Closed

Wampanoag Tribe of Gray Head (Aquinnah)
c/o Bret Stearns, Indirect Services Administrator
20 Black Brook Road
Aquinnah, MA 02535
(508) 645-9265
isa@wampanoagtribe-nsn.gov
Monday-Friday: 9:00 – 5:00; Saturday, Sunday: Closed

Online Access available at:
https://www.bracpmo.navy.mil/brac_bases/northeast/former_nas_south_weymouth.html

Click on “Documents” and scroll down to search for a document.

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COMMENT SHEET – Proposed Plan for Nomans Land Island

Use this space to write your comments or to be added to the mailing list.

The Navy encourages your written comments on Nomans Land Island, Chilmark, Massachusetts. You can use the form below to send written comments. This form is provided for your convenience. (Please print double sided to use sheet and mailing envelope.)

Please mail this form or additional sheets of written comments, postmarked no later than October 15, 2020, to the address shown below.

Mr. David Barney
BRAC Environmental Coordinator
BRAC Program Management Office, East
PO Box 169
South Weymouth, MA 02190

Lined area for writing comments, consisting of 20 horizontal lines.

Comment Submitted by: _____

Address: _____

Affix
Postage

Mr. David Barney
BRAC Environmental Coordinator
BRAC Program Management Office, East
PO Box 169
South Weymouth, MA 02190

----- (Fold on dotted line, staple, stamp, and mail) -----