

**RELEASE ABATEMENT MEASURE  
120-DAY STATUS REPORT  
(Ordnance Debris Removal)**

**NOMANS LAND ISLAND**

**Chilmark, Massachusetts**

**RTN #4-13390**

**Prepared For:**

**United States Department of the Navy  
South Weymouth Naval Air Station  
1134 Main Street  
South Weymouth, Massachusetts 02190-5000**

**Prepared By:**

**Foster Wheeler Environmental Corporation  
470 Atlantic Avenue  
Boston, Massachusetts 02210**

**September 17, 1998**

## TABLE OF CONTENTS

1.0	INTRODUCTION.....	1
2.0	DEP COMMENTS AND CONDITIONAL APPROVAL OF RAM PLAN.....	3
3.0	RAM STATUS.....	5
3.1	Summary of Completed Work and Status of Response Operations.....	5
3.2	Handling of Remediation Waste.....	7
3.3	Remaining RAM Tasks, Schedule and Conclusions.....	8

## LIST OF FIGURES

Figure 1-1	Site Locus.....	2
------------	-----------------	---

## LIST OF TABLES

Table 3-1	Summary of Ordnance Debris Collected from Island.....	6
-----------	---	---

## LIST OF ATTACHMENTS

Attachment A	Aerial Photograph of Island
Attachment B	RAM Plan approval letter by DEP (dated May 20, 1998) Response to Comments letter by the Navy (dated July 2, 1998) DEP letter (dated August 12, 1998) Letter to the DEP from the Navy (dated September 1998)
Attachment C	RAM Transmittal Form
Attachment D	Survey Report for The Radiological Screening Survey on Nomans Land Island, by Inter-Link Group Ltd. And Duke Engineering & Services Environmental Laboratory (dated September 2, 1998)

## 1.0 INTRODUCTION

Pursuant to the Massachusetts Contingency Plan (MCP) in 310 CMR 40.0445, Foster Wheeler Environmental Corporation (Foster Wheeler) has completed this Release Abatement Measure (RAM) 120-Day Status Report on behalf of the United States Department of the Navy (Navy). This RAM Status Report describes completed and on-going activities related to the neutralization of any potential live ordnance and the removal and off-site recycling of inert ordnance debris from Nomans Land Island. The location of the island is depicted in Figure 1-1, and an aerial photograph of the island taken in March 1998 is included in Attachment A.

The work conducted as part of the RAM is a continuation or add-on to a clearance program which began in 1997. After completing a controlled burn of the island in March 1997, the Navy Explosive Ordnance Disposal Mobile Unit Two Detachment in Newport, Rhode Island began a sweep of the island for ordnance removal based upon a plan approved by the Department of Defense Explosive Safety Board (DDESB). Within the first few days of clearance work, it became evident that the number of ordnance items had been underestimated because of the grass that had been cleared by the controlled burn. As a result, the work concentrated on finding ordnance items and confirming them to be inert or rendering them inert.

The island was listed as a site by the Department of Environmental Protection (DEP) in a Notice of Responsibility dated September 26, 1997 (Release Tracking Number 4-13390). The site listing was for the potential release of hazardous materials due to the historical use of the island as an air to surface target range by the Department of Defense (DoD). Because the RAM was conducted prior to Tier Classification of the island or site, a RAM Plan (dated May 7, 1998) was submitted to the DEP for approval. The plan was approved with conditions (in a letter dated May 20, 1998) as discussed below. The RAM Plan approval letter is included in Attachment B. During the project the DEP visited the site on June 24 and August 21, 1998. During the August 21, 1998, visit, DEP personnel also visited the facility receiving and processing the ordnance debris collected from the island as part of the RAM.

Under the Defense Base Closure and Realignment Act of 1990, the island was transferred from the DoD to the Department of the Interior's U.S. Fish and Wildlife Service on June 26, 1998. The ordnance debris removal is one of the largest tasks involved in the transfer agreement between the two departments.

In general, the RAM or ordnance debris removal has involved:

- Site Preparation (a controlled burn of the island with DEP air quality approval was completed on April 28, 1998);
- Surface Clearance of Ordnance Debris and Residual Target Materials;
- Neutralizing Suspected Explosive Ordnance;
- Consolidation of Ordnance related Material;
- Marking of Inert Ordnance;
- Screening for Potential Depleted Uranium (DU);
- Data Compilation and Reporting; and
- Off-site Transport and Recycling of Ordnance Related Materials.

The details of the exact procedure utilized to complete the RAM work is provided in the RAM Plan and corresponding attachments, *Explosive Safety Remediation Plan for Nomans Land Island*, prepared for the Navy for the DDESB in 1997 (Attachment B), and *Unexploded Ordnance Remedial Action Work Plan*, completed by Foster Wheeler (Attachment C) which was required by DDESB prior to conducting the

work. The 1997 plan presents a description and history of the island and an overview of environmental conditions and ordnance use. The target areas are described, followed by a description of the remediation, which was updated and replaced by the Foster Wheeler plan from 1998. The *Unexploded Ordnance Remedial Action Work Plan* essentially covers all aspects of the project.

Pursuant to 310 CMR 40.0441(7), health and safety procedures consistent with the provisions of 310 CMR 40.0018 and the federal Occupational Safety and Health Administration (OSHA) have been implemented. In addition, pursuant to the MCP in 310 CMR 40.0447, the Town of Chilmark and Aqinnah (Gay Head) Board of Selectmen and Board of Health were notified of the initiation of RAM field work in a letter from Foster Wheeler (dated May 18, 1998).

The following sections of the RAM Status Report discusses the DEP comments on the RAM Plan (Section 2.0) and provides the status of the RAM activities (Section 3.0) as specified in the MCP (310 CMR 40.04465[2]).

The required RAM Transmittal form is included in Attachment C.

## 2.0 DEP COMMENTS AND CONDITIONAL APPROVAL OF RAM PLAN

As discussed above, the RAM Plan was approved by the DEP with conditions. In response to the approval letter and conditions or comments, the Navy submitted to the DEP a letter with responses to comments on July 2, 1998 (Attachment B). In response to the letter and based upon site activities, the DEP submitted a letter dated August 12, 1998 (Attachment B), to the Navy listing conditions that were still unresolved. The Navy responded in a letter in September 1998 (Attachment B), responding to some of the conditions and requesting a technical meeting to discuss the outstanding issues. The original comments presented in the RAM Plan conditional approval letter are presented below, along with the most update Navy response or RAM action taken in response to the comment.

*Comment 1: The Department requires performance of an off shore survey for ordnance. This survey and removal are necessary to protect US Fish and Wildlife (USF&W) personnel, as well as trespassers who anchor boats near the beach and visit the island. While we understand the Island will not be open to the public, we also know from discussions with the local communities and with staff from USF&W that historically there has been regular trespassing at the Island. That is unlikely to stop after the Island is transferred to the USF&W Service. The Department recommends that you survey the shore line visually for UXO material from the low tide mark out to a minimum depth of 10 feet. It is our understanding that you can see and remove the UXO material at least to this depth. Please assess and remove identified ordnance.*

**Response:** The issue of an off shore survey for ordnance will be addressed at the proposed technical meeting.

*Comment 2: The Ordnance Debris Removal (ODR) Plan has conflicting details as to where the survey will begin along the shoreline. The Department expects the land ordnance survey to begin at the low tide mark and continue inland.*

Response: The Navy concurs. (Foster Wheeler has completed a survey out to the mean low tide mark and removed the surface ordnance and debris they observed in this region.)

*Comment 3: The Department does not agree with your statement in the Executive Summary that some large, concrete filled inert practice bombs will remain on the island after transfer. The Department requires removal of all waste from the Island, including inert practice ordnance. This will deter souvenir collectors. In addition, any remaining tires on the Island, most notably the tires in the Wildlife Management Area which mark the "No Fire Zone" require collection and removal from the Island.*

Response: Removal of surface debris including large, concrete filled inert practice bombs and tires was included in the RAM Plan and performed by Foster Wheeler.

*Comment 4: The Department generally does not comment on health and safety plans. However, due to the nature of this work and the remoteness of the site, the Department recommends your health and safety plan include time critical contingencies for transporting injured staff to a hospital in case of an emergency.*

Response: The hospitals in the health and safety plan have been notified of the nature of the work on the island and are prepared for emergency situations. The contractor will assure the availability of emergency transportation during any remaining RAM activities on the island.

*Comment 5: Before removal of debris from the island, please conduct a survey of all metal debris for radiological and hazardous materials. No waste should leave the Island without having the waste screened to meet the receiving facilities' acceptance requirements.*

Response: This was completed as discussed below.

*Comment 6: ODR Plan activities do not include the cliffs because they are inaccessible. You should however, visually inspect the cliffs by boat or along the shoreline for exposed ordnance, document the results and remove accessible ordnance. The Operation and Maintenance Plan discussed below should include this area for future inspections and removals as appropriate.*

Response: The Navy concurs. The cliffs have been surveyed, the results documented, and ordnance debris has been removed.

*Comment 7: The Department recommends a geophysical survey in the former target area and along clearly identified paths and other areas frequented by USF&W Service personnel and by trespassers. Please pay particular attention to areas containing significant surficial UXO and debris and to areas where craters show that full charge ordnance exploded.*

Response: This issue will be addressed at the proposed technical meeting.

**Comment 8:** *The Department does not agree with the statement on page 6 in Paragraph 8 that "No UXO clearance will be conducted in the areas of freshwater ponds or beaches". The Department requires inspection of the freshwater ponds and beaches for UXO and debris, with particular attention paid to Ben's Pond. You may limit these inspections to the beach areas around the ponds at shallow water depth. The nature of these ponds make them unlikely areas for swimming and other deeper water activities. Areas along the perimeter, the beach and in the ponds where visual ordnance are seen should be removed. Provisions should be made for removal of ordnance if found when additional work occurs in the ponds during later phases of work.*

**Response:** The Navy concurs and removed accessible ordnance debris in and around the ponds.

**Comment 9:** *Chapter 4-13, Paragraph 4.9 - The Department expects Activity and Use Limitations (AULs) to be placed on the Island by the Navy ensuring that the potential future exposures resulting from future land use will remain consistent with the exposures considered with a Wildlife Preserve. In addition, the Department expects to review the full operation and management plan addressing potential ordnance which may surface in the future at the Island. This plan should include the method and frequency of inspections, who will conduct the inspections, notification procedures for ordnance found in the future, and the process to implement removal of such ordnance.*

**Response:** The Navy concurs. An AUL will be associated with this property. An Operation and Maintenance Plan will be written by the LSP and submitted for review.

### **3.0 RAM STATUS**

All of the field work as proposed in the RAM Plan has been completed as of September 1998. A brief description of the response actions performed and the status of other related activities are presented in this section pursuant to the MCP.

#### **3.1 Summary of Completed Work and Status of Response Operations**

Project preparation included completing a controlled burn of the island to reduce the vegetation cover to facilitate the ordnance debris removal. Foster Wheeler, the Navy and USFWS personnel met with the Chilmark Conservation Commission on April 8, 1998 to discuss the proposed controlled burn and ordnance clearance project. The Conservation Commission did not request any official filings in relation to the proposed work. Subsequently, a request/application (DEP Application No. 4F98012) was submitted to the DEP - Southeast Region in accordance with 310 CMR 7.07(3)(f) by Foster Wheeler (Dated April 20, 1998) to conduct the controlled burn. The request included a Prescribed Burn Prescription from 1997 and Amendment #1 by Fire Management Services, Inc. The application was approved by the DEP in a letter dated April 22, 1998, and the burn took place as proposed on April 28, 1998.

Mobilization of equipment to the site began the week of April 27, 1998, followed by the establishment of a project base camp along the northern portion of the island and clearance of roads and staging areas. The field office for the project was based in New Bedford, Massachusetts and equipment barges and crew boats ferried to and from the island out of New Bedford and Fairhaven, Massachusetts.

Site preparation also included establishing a grid system on the island, which began on May 9, 1998. The 695 grids established on the island were each 60 meters by 60 meters and were completed so that the removal of ordnance debris could be documented as discussed in the *Unexploded Ordnance Remedial Action Work Plan* (Section 19.0).

The ordnance clearance began on the western end of the island on May 26, 1998, where most of the documented target areas were located. The debris removal progressed across the island following the procedures detailed in the *Unexploded Ordnance Remedial Action Work Plan* attached to the RAM Plan (Sections 8.0, 10.0, and 11.0; Surface Clearance and UXO Sweep and Recovery Team Procedures). Ordnance debris removal continued until August 8, 1998.

The amount of debris removed is summarized below in Table 3-1. As presented in the table, out of the 695 grids swept and cleared, 11,085 items were collected weighing 671,306.6 pounds (in addition, 59,847 pounds of non-ordnance scrap were collected). All of the items were practice round type. However, 4,047 items were considered suspect (containing small smoke-charge or residual rocket fuel) and explosively vented between July 24 and August 7, 1998, following the procedure presented in the *Unexploded Ordnance Remedial Action Work Plan* attached to the RAM Plan (Section 13.0, Procedure for Neutralizing Suspect/Live Ordnance). A grid map of the island and tables summarizing the material collected from each grid will be presented in a future submittal (Status or Completion Report).

**Table 3-1**  
**Summary of Ordnance Debris Collected from Island**

Nomenclature	Number of Items Found to Date	Total Weight (lbs.)	Suspect
✓ MK76 Practice Bomb	2,799	69,975	17
✓ MK106 Practice Bomb	4,823	23,632.7	21
40MM Projectile	224	112	0
MK 41 Practice Bomb	23	103.5	4
MK15 Practice Bomb	59	5,900	0
MK7 Bomb	20	20,000	0
MK 117 Bomb	2	1,000	0
M124 Bomb	697	174,250	0
✓ MK 81 Bomb	33	8,250	2
✓ MK 82 Bomb	451	225,500	3
MK 83 Bomb	8	8,000	1
3" Projectile	6	150	0
6" Projectile	2	150	0
5" Rocket Warhead	72	3,888	10
2.25 Rocket	422	5,486	52
2.75 Rocket Warhead	244	4,392	10
5" Rocket Motor	19	722	5
MK 25 Marine Marker	1	15	0
MK 64 SUS	2	30	0
✓ Small Arms	1,114	222.8	0
<b>Total to Date</b>	<b>11,085</b>	<b>671,306.6</b>	<b>4,047</b>
Scrap		59,847	

As discussed below in Section 3.2, the ordnance debris recovered as part of the surface sweep was processed on-site to a "5X" level of decontamination and surveyed for the potential presence of depleted uranium (DU) prior to removal from the island. Removal of the material from the island to Mid-City Steel Corporation for recycling (discussed below) occurred between August 11, 1998 and September 12, 1998.

### **3.2 Handling of Remediation Waste**

Consistent with the RAM Plan and the DEP conditional approval letter, the ordnance debris recovered as part of the surface sweep was processed on-site to a "5X" level of decontamination and surveyed for the potential presence of DU prior to removal from the island. The "5X" level applies when no significant amounts (not sufficient to present an explosive safety hazard) of contaminant remain. Staging and certification operations were presented in the *Unexploded Ordnance Remedial Action Work Plan* attached to the RAM Plan (Section 12.0).

The processing of the material was completed as follows. For this project, the UXO Specialists selected for the responsibility of certifying the items as inert had a minimum of 10 years of combined military and civilian experience in the identification and handling of ordnance items. Individuals selected for this responsibility were required to provide their signatures on certifications for ordnance related materials intended for release outside the DoD.

Each item removed from target areas of Nomans Land Island was examined by an UXO Specialist before movement and certified and marked as inert or segregated for further treatment. Items that were not certifiable as inert were segregated and transported separately to one part of the staging area in the vicinity of the project base camp. In the staging area, inert items were examined by a second UXO Specialist, certified as inert and stockpiled in a secure area. Items that were not certifiable were also examined by a second UXO Specialist and stockpiled in a separate secure area. Items which were not certifiable as inert were reprocessed explosively until inert status could be certified. All ordnance and ordnance related items were processed on-site to a "5X" level of decontamination.

As required by the DEP, the ordnance debris recovered from the island clearance was surveyed for the potential presence of DU. The work was completed by Inter-Link Group Ltd. and Duke Engineering & Services Environmental Laboratory as presented in a plan dated July 23, 1998, that was submitted to the DEP for review prior to conducting the work. Two surveys were completed, between July 31 and August 5, 1998 and on August 31, 1998. As discussed in the attached Survey Report (Attachment D), the work concluded that no unusual or elevated levels of gamma radiation above background levels measured on Martha's Vineyard that would be associated with DU, were present in the ordnance debris staging area. Based upon these findings, which were presented to the DEP after the two surveys, the DEP approved the transport of the material off the island verbally on August 11, 1998 (with follow-up letter on August 12, 1998) after the first survey, and during the week of September 7, 1998, after the second survey.

Each lot of certified ordnance related scrap material was secured to maintain integrity and a certified manifest was prepared for each lot. The certified manifest was signed by an authorized individual who is qualified by training and experience to certify that the lot is inert.

Ordnance related scrap items were transported to a secure storage on the mainland in such a way as to assure the integrity of the shipments. Subsequently, the material was transported to Mid-City Steel Corporation in Westport, Massachusetts for recycling. Range Residue Certificate accompanying each

load, weight slips from Mid-City, and any other applicable documentation will be provided in future RAM report (either Status or Completion Report).

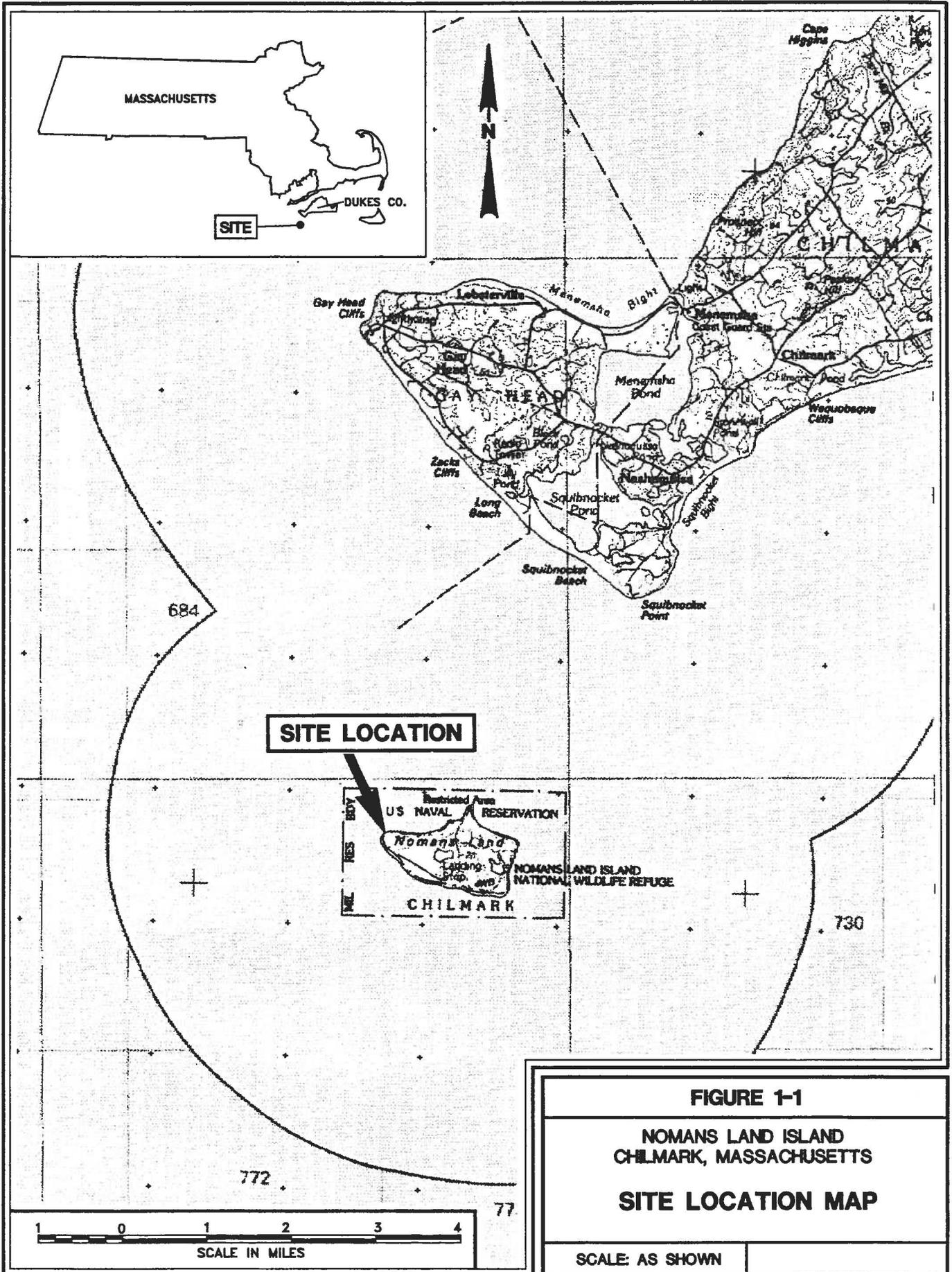
### **3.3 Remaining RAM Tasks, Schedule and Conclusions**

Remaining necessary tasks associated with the RAM prior to submitting a Completion Report include:

- Documentation of remediation waste transportation and disposal;
- Complete Grid Map and Data Tables summarizing ordnance removal information; and
- Meeting with the DEP to discuss the remaining comments or issues as presented in Section 2.0.

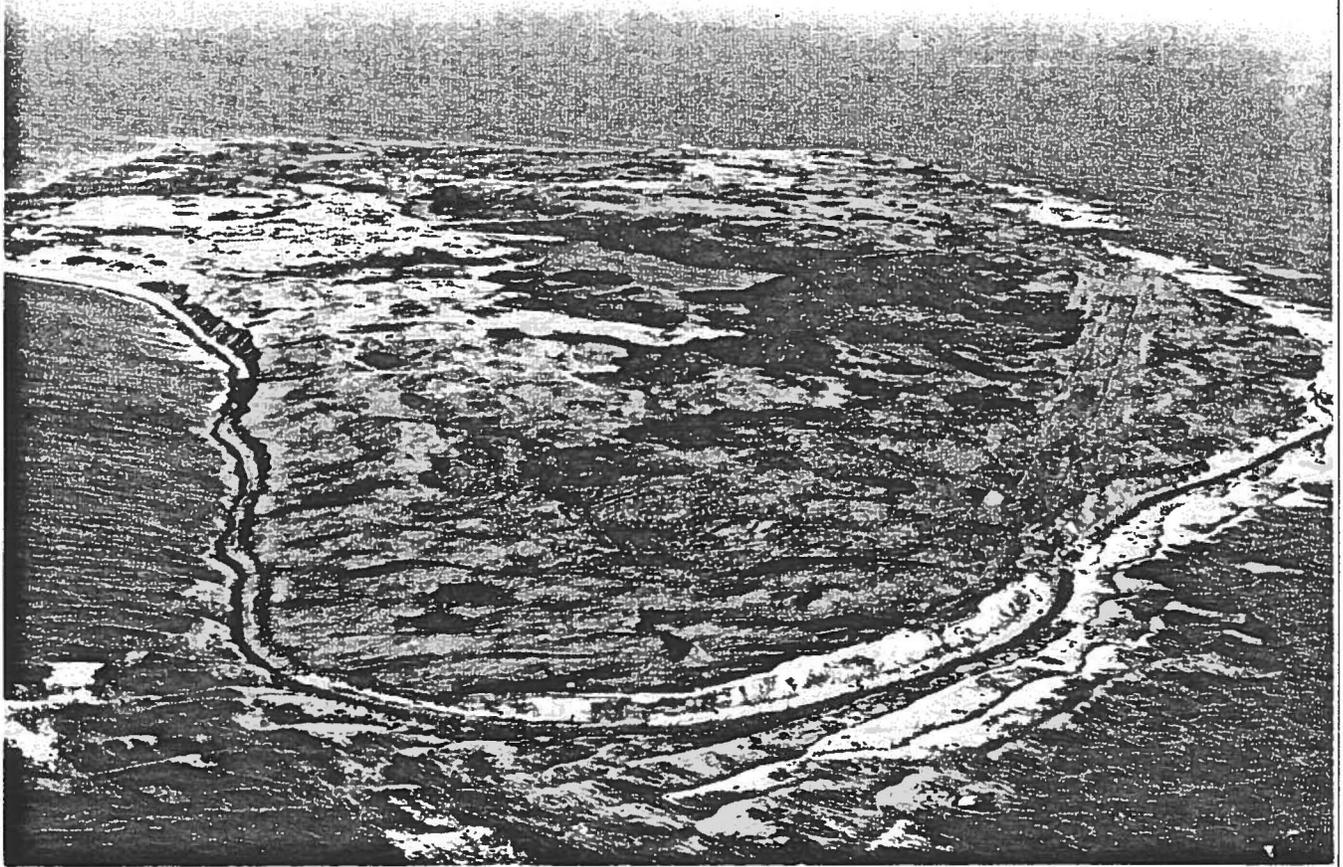
It is anticipated that the first two tasks listed above will be completed by the end of October, 1998, and presented in the next applicable submittal (RAM Status or Completion Report). A meeting with the DEP is tentatively scheduled for early October 1998, to discuss the remaining comments or issues as presented in Section 2.0.

RAM activities completed to date have been conducted in conformance with the RAM Plan and the conditions of the DEP approvals.

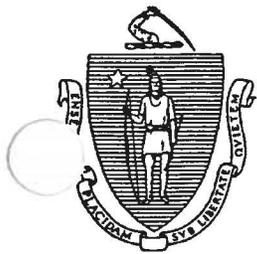


**FIGURE 1-1**  
**NOMANS LAND ISLAND**  
**CHILMARK, MASSACHUSETTS**  
**SITE LOCATION MAP**  
 SCALE: AS SHOWN

Source: USGS 30 Minute Series Topographic Map: Martha's Vineyard MA, 1994.



**NOMANS LAND ISLAND  
CHILMARK, MASSACHUSETTS  
AERIAL PHOTOGRAPH OF ISLAND  
(LOOKING EAST)**



ARGEO PAUL CELLUCCI  
Governor

COMMONWEALTH OF MASSACHUSETTS  
EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
ONE WINTER STREET, BOSTON, MA 02108 617-292-5500

TRUDY COXE  
Secretary

DAVID B. STRUHS  
Commissioner

May 20, 1998

Mr. David Austin  
Foster Wheeler  
470 Atlantic Avenue  
Boston, Massachusetts 02190-5000

Dear Mr. Austin:

The Department has received and reviewed the Release Abatement Measure (RAM) Plans for Ordinance Debris Removal dated May 1, 1998 and for the Underground Storage Tank and Pipeline dated May 7, 1998 to be implemented at Nomans Land Island. The Department approves the Underground Storage Tank and Pipeline plan without conditions and conditionally approves the Ordinance Debris Removal Plan provided that the attached comments are addressed and made part of this plan.

The Department's review and comments are based on the future use of the Island as a National Wildlife Refuge and assume that access to the Island will continue to be restricted from general public use. The only human receptors on the island would be Fish and Wildlife personnel and trespassers.

Due to the short window of opportunity to address remediation at this site, the Department approves the Ordinance Debris Removal Plan with conditions so that the work can begin as soon as possible. The Department requires that you implement the attached comments during the ordinance removal and incorporate them into the RAM plan.

If you have any questions, regarding these comments please contact Ms. Anne Malewicz, Federal Facility Section Chief at (617) 292-5659.

Very truly yours,

*Anne Malewicz Fox*  
Jay Naparstek  
Assistant Deputy Director

Attachment

Nomans Land Island  
May 20, 1998  
Naparstek to Austin  
page 2

Comments:

The Department requires performance of an offshore survey for ordnance. This survey and removal are necessary to protect US Fish and Wildlife (USF&W) personnel, as well as trespassers who anchor boats near the beach and visit the Island. While we understand the Island will not be open to the public, we also know from discussions with the local communities and with staff from USF&W that historically there has been regular trespassing at the Island. That is unlikely to stop after the Island is transferred to the USF&W Service. The Department recommends that you survey the shoreline visually for UXO material from the low tide mark out to a minimum depth of 10 feet. It is our understanding you can see and remove the UXO material at least to this depth. Please assess and remove identified ordnance.

The Ordnance Debris Removal (ODR) Plan has conflicting details as to where the survey will begin along the shoreline. The Department expects the land ordnance survey to begin at the low tide mark and continue inland.

The Department does not agree with your statement in the executive summary that some large, concrete filled inert practice bombs will remain on the island after transfer. The Department requires removal of all waste from the Island, including inert practice ordnance. This will deter souvenir collectors. In addition, any remaining tires on the island, most notably the tires in the Wildlife Management Area which mark the "No Fire Zone" require collection and removal from the island.

The Department generally does not comment on health and safety plans. However, due to the nature of this work and the remoteness of this site, the Department recommends your health and safety plan include time critical contingencies for transporting injured staff to a hospital in case of an emergency.

Before the removal of debris from the island, please conduct a survey of all metal debris for radiological and hazardous materials. No waste should leave the island without having the waste screened to meet the receiving facilities' acceptance requirements.

ODR Plan activities do not include the cliffs because they are inaccessible. You should however, visually inspect the cliffs by boat or along the shoreline for exposed ordnance, document the results and remove accessible ordnance. The Operation and Maintenance Plan discussed below should include this area for future inspections and removals as appropriate.

Nomans Land Island  
May 20, 1998  
Naparstek to Austin  
page 3

The Department recommends a geophysical survey in the former target area and along clearly identified paths and other areas frequented by USF&W Service personnel and by trespassers. Please pay particular attention to areas containing significant surficial UXO and debris and to areas where craters show that full charge ordnance exploded. The current work plan should include this survey.

The Department does not agree with the statement on page 6 in Paragraph 8 that " No UXO clearance will be conducted in the areas of freshwater ponds or beaches". The Department requires inspection of the fresh water ponds and beaches for UXO and debris, with particular attention paid to Ben's Pond. You may limit these inspections to the beach areas around the ponds at a shallow water depth. The nature of these ponds make them unlikely areas for swimming and other deeper water activities. Areas along the perimeter, the beach and in the ponds where visual ordnance are seen should be removed. Provisions should be made for removal of ordnance if found when additional work occurs in the ponds during later phases of work.

Referencing chapter 4-13 paragraph 4.8

The Department expects Activity Use and Limitations (AULs) to be placed on the Island by the Navy ensuring that the potential future exposures resulting from future land use will remain consistent with the exposures considered with a Wildlife Preserve. In addition, the Department expects to review the full operation and management plan addressing potential ordnance which may surface in the future at the island. This plan should include the method and frequency of inspections, who will conduct the inspections, notification procedures for ordnance found in the future, and the process to implement removal of such ordnance.

If there are any unexpected changes to these plans or to the scope of the work due to physical conditions, please notify the Department as soon as possible.



**DEPARTMENT OF THE NAVY**

NORTHERN DIVISION  
NAVAL FACILITIES ENGINEERING COMMAND  
10 INDUSTRIAL HIGHWAY  
MAIL STOP, #82  
LESTER, PA 19113-2000

IN REPLY REFER TO

**JUL 02 1998**

5090  
Code 1811/DCK

Mr. Jay Naparstek  
Ms. Anne Malewicz  
Massachusetts Department of Environmental Protection  
Federal Facilities Bureau of Waste Site Cleanup  
Facilities Bureau of Waste Site Cleanup  
One Winter Street  
Boston, MA 02108

**SUBJECT: RESPONSE TO COMMENTS ON DRAFT RELEASE ABATEMENT MEASURE (RAM) PLAN FOR ORDNANCE DEBRIS REMOVAL FOR NOMANS LAND ISLAND, MA (RTN: # 413390 NOMANS LAND ISLAND CHILMARK, MA)**

Dear Mr. Naparstek and Ms. Malewicz,

Thank you for your comments of May 20, 1998 to Mr. David Austin of Foster Wheeler, Boston, MA on the subject action. We transmitted our responses to your comments through an email on June 22 1998, and have attached them to this letter as a formal response.

We began discussions on the RAM plan, your comments and our responses at our site visit on Nomans Land Island on May 24, 1998. We continue to work through the issues which you mention in your letter dated July 1, 1998. Ms. Malewicz and I have had several productive conversations since the site visit, and I firmly believe we can satisfy the conditions of the approval of the subject plan.

We have contacted Mr. John Robinson, who you recommended as an authority regarding radiological screening the ordnance. While we are confident that our original plan for screening the ordnance met regulations, we understand that an additional step is required to meet MADEP's RAM requirements which are intended to address the concerns of the public. We have directed our contractor to retain all the metal ordnance debris on the island until the Navy and the MADEP have reached a mutual agreement on the screening plan.

The Navy, our contractor Foster Wheeler, and Licensed Site Professional, Mr. David Austin will continue to work with your department to resolve any and all outstanding issues, with the common goal of protecting human health and the environment. We will continue to discuss and address all safety and ordnance issues you have concerning the future use of the island.

We will place your comments and our responses regarding this transfer in the administrative record at the former NAS South Weymouth CSO as well as the information repository which will be established at the Gay Head (Aqinnah) Municipal Complex.

A copy of the signed transfer agreement between the Department of the Navy and the Department of the Interior of Nomans Land Island is included for your information.

You have my commitment that we will continue to strive to meet the requirements of all applicable local, state, and federal laws and regulations regarding the cleanup of Nomans Land Island. We are interested in meeting with you so we can get a better understanding of your position on any issues which the MADEP believes remain unresolved.

Please feel free to contact Ms. Heather MacDonough at (610) 595-0567 X134, myself at X127, or Mr. Dave Barney at (781) 682-2771 at the NAS Caretaker Site Office if you have any questions. Thank you, for your continued assistance.

*Dawn C. Kincaid*

D.C. KINCAID, REM  
Branch Head  
BRAC Compliance Management

Copy to:  
(with enclosures)  
Department of Interior, US Fish and Wildlife Service  
Great Meadows National Wildlife Refuge  
Tim Prior  
Bud Oliveira, Refuge Manager

Patty Whittemore-Marajh  
EPA Region I  
Office of Site Remediation and Restoration  
90 Canal Street  
Boston, MA 02203

Mr. David Austin, LSP ←  
Foster Wheeler Environmental  
470 Atlantic Avenue  
Boston, MA 02210-2208

Administrative Record File CSO South Weymouth  
Information Repository Gay Head (Aqinnah) Municipal Complex

**INTERNAL COPIES TO:**

**(w/enclosures)**

**NAS South Weymouth CSO (Tom Papoulias/Dave Barney/LCDR Garcia)**

**NAS South Weymouth BTC (in care of CSO)**

**09C/Ralph Lombardo**

**202**

**1811**

**1812/Heather MacDonough**

**1831/DJB**

**INTERNAL COPIES TO: (w/o enclosures)**

**09TA**

**09TA/Terry Falvery**

**09TA Greg Preston**

**202**

**18**

**181**

**1812**

**182**

**183**

**1831**

**1823**

**1823/MEK**

**402/Bill Faustman**

**402/Tim Bramhall**

**02/Dave Rule**

**G. F**

Response to MADEP Comments on RAM Plans for Ordnance Debris Removal on Nomans Land Island

Comment #1:

The Department requires performance of an off shore survey for ordnance. This survey and removal are necessary to protect US Fish and Wildlife (USF&W) personnel, as well as trespassers who anchor boats near the beach and visit the Island. While we understand the Island will not be open to the public, we also know from discussions with the local communities and with staff from USF&W that historically there has been regular trespassing at the Island. That is unlikely to stop after the Island is transferred to the USF&W Service. The Department recommends that you survey the shoreline visually for UXO material from the low tide mark out to a minimum depth of 10 feet. It is our understanding you can see and remove the UXO material at least to this depth. Please assess and remove identified ordnance.

*The Navy's Remedial Action Contractor (RAC), Foster Wheeler, has completed a survey out to the mean low tide mark and removed the surface ordnance and debris they observed in this region. An off shore (beyond the mean low tide mark) survey for ordnance to protect USF&W Service personnel and trespassers is not required as determined by the Department of Defense Explosives Safety Board (DDESB). A DDESB approved Explosives Safety Plan was prepared for Nomans Land Island which supports transfer to the Department of the Interior and re-use by USFWS for an uninhabited wildlife refuge.*

*The approved and implemented Explosives Safety Plan included a surface sweep of ordnance which when used in conjunction with continued DoD surveillance of the island, consistent with DoD 6055.9 STD, and through implementing the recommendations in the Explosives Safety summary Document (Dated 13 March 1998), have been determined to be protective of human health on the Island after transfer. USFWS concurred that a surface sweep and this follow on management plan is sufficient to meet their reuse needs. The DDESB approved this plan for the proposed reuse scenario, and explosives safety remediation (surface sweep) actions were conducted in 1997. Removal of the debris from the surface sweep is currently ongoing and is consistent with regulations and safety protocol (5X), see response to Comment #5 below.*

*The water surrounding the Island is and will remain restricted. Warning signs are posted around the Island and additionally this area is noted as restricted on nautical charts. The Navy and USFWS continue with community relations to advise the public of management efforts that include continued restriction to access to the Island. Upon transfer the USF&WS will be responsible for maintenance of the warning signs and for public safety regarding access to the Island.*

Comment #2:

The Ordnance Debris Removal (ODR) Plan has conflicting details as to where the survey will begin along the shoreline. The Department expects the land ordnance survey to begin at the low tide mark and continue inland.

*The Navy concurs.*

Comment #3:

The Department does not agree with your statement in the Executive Summary that some large, concrete filled inert practice bombs will remain on the island after transfer. The Department requires removal of all waste from the Island, including inert practice ordnance. This will deter souvenir collectors. In addition, any remaining tires on the Island, most notably the tires in the Wildlife Management Area which mark the "No Fire Zone" require collection and removal from the Island.

*Removal of surface debris including large, concrete filled inert practice bombs and tires is included in the RAM Plan.*

Comment #4:

The Department generally does not comment on health and safety plans. However, due to the nature of this work and the remoteness of the site, the Department recommends your health and safety plan include time critical contingencies for transporting injured staff to a hospital in case of an emergency.

*The hospitals in the health and safety plan have been notified of the nature of the work on the Island and are prepared for emergency situations. The contractor will assure the availability of emergency transportation.*

Comment #5:

Before the removal of debris from the island, please conduct a survey of all metal debris for radiological and hazardous materials. No waste should leave the Island without having the waste screened to meet the receiving facilities' acceptance requirements.

*During the removal of ordnance related solid waste, the Navy will comply with environmental regulations. Based upon our knowledge of this waste from historical records and visual inspections, we will assure that procedures are in place and are followed to appropriately screen and render safe the solid waste prior to transportation off the island. The method of decontamination protocol is known as "5X". This level of decontamination insures that the solid waste removed from the island is suitable for recycling. All ordnance related solid waste will be recycled through the Defense Reutilization and Marketing Office (DRMO), the receiving facility of record. This is consistent with the EPA's Military Munitions Rule.*

*No radiological survey on the ordnance related solid waste is deemed necessary. This conclusion was first discussed in our Responsiveness Summary dated 12 March 1998, responding to USEPA and MADEP comments on our Environmental Summary Document (ESD) for transfer to the Department of the Interior. No ammunition containing depleted uranium (DU) was used on Nomans Land Island. Cognizant authorities from the Navy's Radiological Affairs Support Office and the U.S. Air Force conclusively state that past activities at this practice range did not include the use of DU. Non-combat use of DU munitions is strictly controlled by licensing and permit requirements. DU has never been authorized or permitted for use at Nomans Land. Therefore, we conclude that a radiological survey is neither necessary nor a prudent expenditure of BRAC funds.*

*A due diligent search for information on DU was performed in preparation of our ESD which supports transfer. The Navy (RASO) and the Air Force's equivalent radiological authority performed extensive reviews of permit records, special investigation records, and DU usage records and provided us with the results of these document reviews. Their supporting documents are attached to this response. Based upon this definitive information, it is our conclusion that no radiological survey is necessary to rule out the presence of DU on Nomans Land Island.*

*If the USEPA or the MADEP has substantiated definitive evidence to the contrary of the cognizant radiological authorities of the US Navy and the US Air Force, we would certainly review this information and reconsider our decision.*

Comment #6:

ODR Plan activities do not include the cliffs because they are inaccessible. You should however, visually inspect the cliffs by boat or along the shoreline for exposed ordnance, document the results and remove accessible ordnance. The Operation and Maintenance Plan discussed below should include this area for future inspections and removals as appropriate.

*As part of the MCP Phase I Site Investigation, it is necessary to include the cliffs in the Phase I site reconnaissance which will document conditions/presence of debris. The details of the Operation and Maintenance Plan are being addressed by the Navy and the USF&W Service, and this area of the island will be included as other locations on the island for future management consideration. Please see the response to comment #9 relating to the future handling of ordnance.*

Comment #7:

The Department recommends a geophysical survey in the former target area and along clearly identified paths and other areas frequented by USF&W Service personnel and by trespassers. Please pay particular attention to areas containing significant surficial UXO and debris and to areas where craters show that full charge ordnance exploded.

*In accordance with the Explosives Safety Remediation Plan, a surface sweep of Nomans Land Island was conducted, this action was considered sufficient to meet the intended reuse as agreed to between the Department of the Navy and the Department of the Interior (USF&WS). The sweep conducted in 1997 included areas frequented by USF&W Service personnel and trespassers as well as in areas where ordnance may have been exploded. Grid maps were provided as part implementation of the Explosives Safety Remediation Plan by the Explosives Ordnance Detachment. The grid maps identify areas which contained the largest concentrations of ordnance found during the surface sweep performed in 1997. For safe removal of the ordnance related solid waste by vehicle, pathways were cleared by the Navy's RAC contractor, Foster Wheeler. Close out reports will be provided to document all actions taken under the MCP/solid waste removal programs. This information will be provided to USF&WS to incorporate in their management plans.*

Comment #8:

The Department does not agree with the statement on page 6 in Paragraph 8 that "No UXO clearance will be conducted in the areas of freshwater ponds or beaches". The Department requires inspection of the freshwater ponds and beaches for UXO and debris, with particular attention paid to Ben's Pond. You may limit these inspections to the beach areas around the ponds at shallow water depth. The nature of these ponds make them unlikely areas for swimming and other deeper water activities. Areas along the perimeter, the beach and in the ponds where visual ordnance are seen should be removed. Provisions should be made for removal of ordnance if found when additional work occurs in the ponds during later phases of work.

*We agree that the brush around the ponds has acted as a formidable natural barrier to human access to the ponds. The surface sweep of Nomans Land Island in 1997 included inspection of areas around the freshwater ponds and beaches. Surface ordnance visible and accessible at that time was removed. We are considering removing some of the dense brush in order to provide more thorough inspection of these areas. Clearing of this brush would be coordinated with the USF&W Service. Ordnance related solid waste that is subsequently discovered and is reasonably accessible will be removed as practicable in accordance with the Explosives Safety Remediation Plan.*

Comment #9:

Referencing chapter 4-13 paragraph 4.8

The Department expects Activity Use Limitations (AULs) to be placed on the Island by the Navy ensuring that the potential future exposures resulting from future land use will remain consistent with the exposures considered with a Wildlife Preserve. In addition, the Department expects to review the full operation and management plan addressing potential ordnance which may surface in the future at the Island. This plan should include the method and frequency of inspections, who will conduct the inspections, notification procedures for ordnance found in the future, and the process to implement removal of such ordnance.

*While "Activity Use Limitations" (AULs) are not placed on federal property which is remaining within the control of the United States of America, risk management measures and notices as appropriate will be included in final transfer documents agreed to between the Department of the Navy and the Department of the Interior. The Navy will provide to the Department of Interior USF&WS all environmental site closeout documentation and review the Explosives Safety Summary Document's recommendations with USF&WS at the conclusion of the Navy's remedial efforts. This will include final transfer of pertinent information about the past use, existing conditions, continued and new responsibilities, and any restrictions imposed upon the future use of Nomans Land Island as a result of the final condition of the property.*



DEPARTMENT OF THE NAVY  
THE ASSISTANT SECRETARY OF THE NAVY  
(INSTALLATIONS AND ENVIRONMENT)  
1000 NAVY PENTAGON  
WASHINGTON, D.C. 20350-1000

June 26, 1998

MEMORANDUM FOR COMMANDER, NAVAL FACILITIES ENGINEERING COMMAND

Subj: INTERAGENCY TRANSFER OF NAVY BASE CLOSURE PROPERTY AT  
NOMANS LAND ISLAND, AN OFF-SITE AREA ASSOCIATED WITH NAVAL  
AIR STATION SOUTH WEYMOUTH, MASSACHUSETTS, TO THE  
DEPARTMENT OF THE INTERIOR FOR USE BY THE U.S. FISH AND  
WILDLIFE SERVICE

Ref: (a) COMNAVFACENGCOM memo of April 17, 1998  
(b) DOD Base Reuse Implementation Manual, Chapter 3.2

Encl: (1) ASN(I&E) ltr of June 26, 1998  
(2) Memorandum For The Record of June 26, 1998

In response to reference (a) and pursuant to the authority granted to the Secretary of the Navy under the provisions of 16 U.S.C. § 667 (b), I have approved the Department of the Interior's request for a "no cost" transfer of approximately 628 acres of land known as Nomans Land Island, Massachusetts, to the Department of the Interior for use by the U.S. Fish And Wildlife Service for the permanent protection of the Island's migratory birds, wildlife and habitat. You or your designee are hereby authorized to complete this transfer to Interior for use by the U.S. Fish And Wildlife Service.

Enclosure (1) is a copy of my letter to the Secretary of the Interior approving the transfer request. Enclosure (2) is a copy of the Memorandum For The Record as required by reference (b).

A handwritten signature in cursive script that reads "Robert B. Pirie, Jr.".

ROBERT B. PIRIE, JR.

Enclosures



DEPARTMENT OF THE NAVY  
THE ASSISTANT SECRETARY OF THE NAVY  
(INSTALLATIONS AND ENVIRONMENT)  
1000 NAVY PENTAGON  
WASHINGTON, D.C. 20380-1000

June 26, 1998

The Honorable Bruce Babbitt  
Secretary of the Interior  
1849 C Street, N.W.  
Washington, D.C. 20240

Dear Mr. Secretary:

By letter of November 22, 1995, the Department of the Interior's U.S. Fish And Wildlife Service requested an interagency transfer of Navy base closure property known as Nomans Land Island for the protection of migratory birds and other wildlife. The island is composed of approximately 628 acres of land associated with the former Naval Air Station South Weymouth, Massachusetts, and is located 2.7 miles southwest of Martha's Vineyard, Massachusetts.

Under the authority of Title 16, United States Code, Section 667b, I hereby transfer to the Department of the Interior, without any requirement for reimbursement to the Department of the Navy, approximately 628 acres of land known as Nomans Land Island.

Navy has complied with the National Environmental Policy Act of 1969, by concluding that this interagency transfer is categorically excluded in accordance with 32 CFR 775. Navy has prepared a Finding of Suitability to Transfer (FOST) the property. The FOST concludes that this property is suitable for transfer to another Federal agency. We will provide copies of the FOST and other pertinent transfer documents under separate correspondence.

As a result of this interagency transfer, the Department of the Interior will accept responsibility for custody and accountability as well as protection and maintenance of the property. This transfer is subject to the attached Statement of Conditions, Covenants, and Reservations of Transfer that arise out of the property's previous use as a gunnery and bombing range.

In arranging for the transfer of custody and accountability of this property, your staff should contact the Naval Facilities Engineering Command's Northern Division in Lester, Pennsylvania. The Commanding Officer may be reached at the following address:

Captain W. P. Fogarty, CEC, USN  
Commanding Officer  
Naval Facilities Engineering Command  
Northern Division  
10 Industrial Highway, Mail Stop #82  
Lester, Pennsylvania 19113-2090  
Telephone: (610) 595-0600

Navy is pleased to help advance the programs of the Department of the Interior and the United States Fish And Wildlife Service by providing Nomans Land Island for inclusion in the Great Meadows National Wildlife Refuge.

Sincerely,



ROBERT B. PIRIE, JR.

**CONDITIONS, COVENANTS, AND RESERVATIONS OF TRANSFER  
APPROXIMATELY 628 ACRES OF LAND  
KNOWN AS NOMANS LAND ISLAND, MASSACHUSETTS  
FROM THE DEPARTMENT OF THE NAVY TO THE  
DEPARTMENT OF INTERIOR, U.S. FISH AND WILDLIFE SERVICE**

This transfer is subject to the following conditions, covenants, and reservations:

a. This transfer is subject to the terms and conditions of the Finding of Suitability to Transfer attached hereto and made a part hereof as enclosure (2) and the Explosive Safety Remediation Plan for Nomans Land Island attached hereto and made a part hereof as enclosure (3).

b. The Department of the Navy reserves and retains the right of access to the property transferred herein for the purpose of conducting ongoing investigations, studies, and required remedial action related to environmental clean-up.

c. The Department of the Navy, subject to the availability of appropriated funds, shall retain the responsibility on behalf of the Government to process and defend any claims made against the Government for personal injury and property damage arising from the Department of the Navy activities prior to the effective date of this transfer or the condition of the property as of the effective date of this transfer. Provided, however, that the Department of Interior, U. S. Fish and Wildlife Service shall secure the property against any and all trespassers, conduct periodic surveillance and install and maintain appropriate and adequate warning devices. The Department of the Navy agrees to provide U. S. Fish and Wildlife a total of twelve (12) "No Trespassing" signs.



DEPARTMENT OF THE NAVY  
THE ASSISTANT SECRETARY OF THE NAVY  
(INSTALLATIONS AND ENVIRONMENT)  
1000 NAVY PENTAGON  
WASHINGTON, D.C. 20380-1006

June 26, 1998

MEMORANDUM FOR THE RECORD

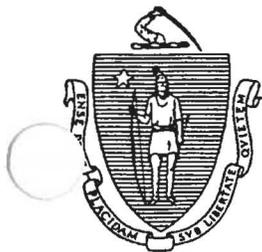
Subj: INTERAGENCY TRANSFER OF NAVY BASE CLOSURE PROPERTY AT  
NOMANS LAND ISLAND, AN OFF-SITE AREA ASSOCIATED WITH  
NAVAL AIR STATION SOUTH WEYMOUTH, MASSACHUSETTS, TO THE  
DEPARTMENT OF THE INTERIOR FOR USE BY THE U.S. FISH AND  
WILDLIFE SERVICE

Pursuant to 32 CFR Part 175.7(a)(10), I have considered the following factors and determined that they support this request for transfer:

- (1) The requirement for the property is valid and appropriate;
- (2) The proposed use is consistent with the highest and best use of the property;
- (3) The requested transfer will not have an adverse impact on the transfer of any remaining portion of the base;
- (4) The proposed transfer will not establish a new program or substantially increase the level of an agency's existing program;
- (5) The provisions of 16 U.S.C. § 667(b)-(d) authorize transfer of the property at no cost;
- (6) The proposed transfer addresses applicable environmental responsibilities to the satisfaction of Navy;
- (7) The proposed transfer is in the best interest of the Government;
- (8) The requesting agency is the best agency to hold the property.

Handwritten signature of Robert B. Pirie, Jr. in black ink, appearing as "R B Pirie Jr".  
ROBERT B. PIRIE, JR.

COMMONWEALTH OF MASSACHUSETTS  
EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
ONE WINTER STREET, BOSTON, MA 02108 617-292-5500



ARGEO PAUL CELLUCCI  
Governor

TRUDY COXE  
Secretary

DAVID B. STRUHS  
Commissioner

Ms. C.D. Kincaid, REM  
Branch Head  
BRAC Compliance Management

David Austin, LSP  
Foster Wheeler  
Boston, MA 02108

August 12, 1998

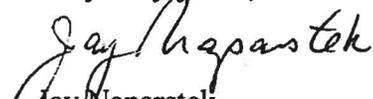
Dear Ms. Kincaid & Mr. Austin:

The Department has received the Navy's letter dated July 2, 1998 regarding the Department's conditional approval of the Release Abatement Measure (RAM) Plan for Ordnance Debris. Several issues raised in the Department's conditional approval have not been adequately addressed in the Navy's letter. Attached to this letter is a summary of those issues. We recommend follow up discussions with you to resolve the remaining issues.

The Department acknowledges that a radiological survey of the scrap metal in the holding area on the island has been completed as required, and radiological levels were within normal background levels. Based on these results, the Department verbally approved removal of this scrap metal on August 11, 1998 for off site disposal.

We appreciate your cooperation to date. To schedule a meeting to discuss the remaining issues or, if in the interim you have any questions regarding this letter please contact Anne Malewicz, Federal Facility Section Chief at 617 292 5659.

Very truly yours,

  
Jay Naparstek  
Assistant Deputy Director

Kincaid-Austin/ Naparstek  
Attachment to August 12, 1998 letter

**Comment #1**

The Department requires performance of an off shore survey for ordnance.

**Comment #6**

The ODR plan activities do not include the cliffs because they are inaccessible. You should however, visually inspect the cliffs by boat or along the shoreline for exposed ordnance, document the results and remove accessible ordnance.

**Comment #7**

The Department recommends a geophysical survey in the former target area and along clearly identified paths and other areas frequented by USF&W Service personnel and by trespassers. Please pay particular attention to areas containing significant surgical UXO and debris and to areas where craters show that full charge ordnance exploded.

**Comment #8**

The Department does not agree with the statement on page 6 in Paragraph 8 that "NO UXO clearance will be conducted in the areas of freshwater ponds or beaches". The Department requires inspection of the freshwater ponds and beaches for UXO and debris, with particular attention paid to Ben's Pond. You may limit these inspection to beach areas around the ponds at shallow water depth. The nature of these ponds make them unlikely areas for swimming and other deeper water activities. Areas along the perimeter, the beach and in the ponds where visual ordnance are seen should be removed. Provisions should be made for removal ordnance if found where additional work occurs in the ponds during later phases of work.

**Comment #9**

The Department expects Activity Use Limitations (AULs) to be placed on the Island by the Navy ensuring that the potential future exposures resulting from land use will remain consistent with the exposures considered with a Wildlife Preserve. In addition, the Department expects to review the full operation and management plan addressing potential ordnance which may surface in the future at the Island. This plan should include the method and frequency of inspections, who will conduct the inspections, notification procedures for ordnance found in the future, and the process to implement removal of such ordnance.



## DEPARTMENT OF THE NAVY

NORTHERN DIVISION  
NAVAL FACILITIES ENGINEERING COMMAND  
10 INDUSTRIAL HIGHWAY  
MAIL STOP, #82  
LESTER, PA 19113-2090

IN REPLY REFER TO

5090  
Code 1812/HKM

Mr. Jay Naparstek  
Ms. Anne Malewicz  
Massachusetts Department of Environmental Protection  
Federal Facilities Bureau of Waste Site Cleanup  
Facilities Bureau of waste Site Cleanup  
One Winter Street  
Boston, MA 02108

Subject: NOMANS LAND ISLAND RELEASE ABATEMENT COMMENTS

Dear Mr. Naparstek and Ms. Malewicz:

Thank you for your letter dated August 12, 1998 regarding issues included in the conditional approval of the Release Abatement Measure (RAM) Plan for Ordnance debris. The August 21, 1998 site visit by various state and federal representatives helped reach an understanding of the current site conditions and the status of the ongoing actions. Most of the outstanding issues addressed in the Department's letter have been completed. The issues of an offshore survey and a geotechnical survey require a more in depth technical discussion to reach a mutual understanding. As suggested in your letter, the Navy would like to schedule a technical meeting to discuss these issues with the Department for late September or early October. The Project Manager, Ms. Heather MacDonough, will be in touch with you shortly to schedule this meeting.

For responses on each of the issues addressed in the Department's letter, please see the attached response summary.

Thank you for your cooperation. We look forward to seeing you at the upcoming technical meeting.

Sincerely,

A handwritten signature in cursive script that reads "Dawn Kincaid".

D. C. KINCAID, REM  
Head, BRAC Compliance Management  
By direction of the Commanding Officer

Comment #1

The Department requires performance of an offshore survey for ordnance.

*We acknowledge your input. This issue will be addressed at the proposed technical meeting.*

Comment #6

The ODR plan activities do not included the cliffs because they are inaccessible. You should however, visually inspect the cliffs by boat along the shoreline for exposed ordnance, document the results and remove accessible ordnance.

*The Navy concurs. The cliffs have been surveyed, the results documented, and ordnance debris has been removed.*

Comment #7

The Department recommends a geophysical survey in the former target area and along clearly identified paths and other areas frequented by USF&W Service personnel and by trespassers. Please pay particular attention to areas containing significant surficial UXO and debris and to areas where craters show that full charge ordnance exploded.

*We acknowledge your input. This issue will be addressed at the proposed technical meeting.*

Comment #8

The Department does not agree with the statement on page 6 in paragraph 8 that, "No UXO clearance will be conducted in the areas of freshwater ponds or beaches". The Department requires inspection of freshwater ponds and beaches for UXO and debris, with particular attention paid to Ben's Pond. You may limit these inspections to beach areas around the ponds at shallow water depths. The nature of these ponds make them unlikely areas for swimming and other deeper water activities. Areas along the perimeter, the beach and in the ponds where visual ordnance are seen should be removed. Provisions should be made for removal of ordnance if found when work occurs in the ponds during later phases of work.

*The Navy concurs and has removed accessible ordnance debris in and around the ponds.*

Comment #9

The Department expects Activity Use Limitations (AULs) to be placed on the Island by the Navy ensuring that the potential future exposures resulting from future land use will remain consistent with the exposures considered with a Wildlife Preserve. In addition, the Department expects to review the full operation and management plan addressing potential ordnance which may surface in the future at the Island. This plan should include the method and frequency of inspections, who will conduct the inspections, notification procedures for ordnance found in the future, and the process to implement removal of such ordnance.

*The Navy concurs. An AUL will be associated with this property. An O&M plan will be written by the LSP and submitted for review.*



**RELEASE & UTILITY-RELATED ABATEMENT  
MEASURE (RAM & URAM) TRANSMITTAL FORM**

Release Tracking Number

4 - 13390

Pursuant to 310 CMR 40.0444 - 0446 and 310 CMR 40.0462 - 0465 (Subpart D)

**SITE LOCATION:**

Site Name: (optional) Nomans Land Island

Street: \_\_\_\_\_ Location Aid: \_\_\_\_\_

City/Town: Chilmark ZIP Code: 02535

Check here if a Tier Classification Submittal has been provided to DEP for this Release Tracking Number.

Related Release Tracking Numbers That This RAM or URAM Addresses: \_\_\_\_\_

**B. THIS FORM IS BEING USED TO:** (check all that apply)

- Submit a RAM Plan (complete Sections A, B, C, D, E, F, J, K, L and M).  
 Check here if this RAM Plan is an update or modification of a previously approved written RAM Plan. Date Submitted: \_\_\_\_\_
- Submit a RAM Status Report (complete Sections A, B, C, E, J, K, L and M).
- Submit a RAM Completion Statement (complete Sections A, B, C, D, E, G, J, K, L and M).
- Confirm or Provide URAM Notification (complete Sections A, B, H, K, L and M).
- Submit a URAM Status Report (complete Sections A, B, C, E, J, K, L and M).
- Submit a URAM Completion Statement (complete Sections A, B, C, D, E, I, J, K, L and M).

You must attach all supporting documentation required for each use of form indicated, including copies of any Legal Notices and Notices to Public Officials required by 310 CMR 40.1400.

**C. SITE CONDITIONS:**

Check here if the source of the Release or Threat of Release is known.

If yes, check all sources that apply:  UST  Pipe/Hose/Line  AST  Drums  Transformer  Boat

Tanker Truck  Vehicle  Other Specify: Ordnance debris

Identify Media and Receptors Affected: (check all that apply)  Air  Groundwater  Surface Water  Sediments  Soil

Wetlands  Storm Drain  Paved Surface  Private Well  Public Water Supply  Zone 2  Residence

School  Unknown  Other Specify: \_\_\_\_\_

Identify Release and/or Threat of Release Conditions at Site: (check all that apply)

2 and 72 Hour Reporting Condition(s)  120 Day Reporting Condition(s)  Other Condition(s)

Describe: Historical use of island by the Department of Defense as an air to surface target range.

RAMs may be conducted concurrently with an IRA only with written DEP approval  
URAMs may not be conducted if any 2 or 72 Hour conditions exist at the site.

Identify Oils and Hazardous Materials Released: (check all that apply)  Oils  Chlorinated Solvents  Heavy Metals

Others Specify: Potential OHM from ordnance debris, including explosives and metals.

**D. DESCRIPTION OF RESPONSE ACTIONS:** (check all that apply)

- Assessment and/or Monitoring Only
- Excavation of Contaminated Soils
- Re-use, Recycling or Treatment
  - On Site  Off Site Est. Vol.: \_\_\_\_\_ cubic yards
  - Describe: \_\_\_\_\_
  - Store  On Site  Off Site Est. Vol.: \_\_\_\_\_ cubic yards
- Deployment of Absorbant or Containment Materials
- Temporary Covers or Caps
- Bioremediation
- Soil Vapor Extraction
- Structure Venting System
- Product or NAPL Recovery

SECTION D IS CONTINUED ON THE NEXT PAGE.



**RELEASE & UTILITY-RELATED ABATEMENT  
MEASURE (RAM & URAM) TRANSMITTAL FORM**

Release Tracking Number

Pursuant to 310 CMR 40.0444 - 0446 and 310 CMR 40.0462 - 0465 (Subpart D)

4 - 13390

**DESCRIPTION OF RESPONSE ACTIONS (continued):**

- Landfill     Cover     Disposal Est. Vol.: \_\_\_\_\_ cubic yards     Groundwater Treatment Systems
- Removal of Drums, Tanks or Containers     Air Sparging
- Describe: \_\_\_\_\_     Temporary Water Supplies
- Removal of Other Contaminated Media     Temporary Evacuation or Relocation of Residents
- Specify Type and Volume: \_\_\_\_\_     Fencing and Sign Posting
- Other Response Actions Describe: \_\_\_\_\_

See 310 CMR 40.0442 for limitations on the scope and type of RAMs.  
See 310 CMR 40.0464 for performance standards for URAMs.

- Check here if this RAM or URAM involves the use of Innovative Technologies. DEP is interested in using this information to aid in creating an Innovative Technologies Clearinghouse.

Describe Technologies: \_\_\_\_\_

**E. TRANSPORT OF REMEDIATION WASTE: (if Remediation Waste has been sent to an off-site facility, answer the following questions)**

Name of Facility: Mid-City Steel Corporation

Town and State: Westport, MA

Quantity of Remediation Waste Transported to Date: 671,306.6 lbs.

**F. RAM PLAN:**

- Check here if this RAM Plan received previous oral approval from DEP as a continuation of a Limited Removal Action (LRA).

Date of Oral Approval: \_\_\_\_\_

- If a RAM Compliance Fee is required, check here to certify that the fee has been submitted. You MUST attach a photocopy of the payment. See 310 CMR 40.0444(2) to learn when a fee is not required.

- Check here if the RAM Plan is proposed for a Transition Site. If this is the case, you may need to attach an LSP Evaluation Opinion prior to undertaking the RAM, if not previously provided. See 310 CMR 40.0600 for further information about Transition Sites.

**G. RAM COMPLETION STATEMENT:**

- If a RAM Compliance Fee is required in connection with submission of the RAM Completion Statement, check here to certify that the fee has been submitted. You MUST attach a photocopy of the payment. You owe this fee when submitting a RAM Completion Statement if you received oral approval of a RAM that continued an LRA, and have NOT previously submitted a RAM Plan and accompanying fee.

If any Remediation Waste will be stored, treated, managed, recycled or reused at the site following submission of the RAM Completion Statement, you must submit a Phase IV Remedy Implementation Plan, along with the appropriate transmittal form, as an attachment to the RAM Completion Statement.

**H. URAM NOTIFICATION:**

- Identify Location Type: (check all that apply)     Public Right of Way     Utility Easement     Private Property
- Identify Utility Type: (check all that apply)     Sanitary/Combined Sewerage     Water     Drainage     Natural Gas
- Telephone     Steam Lines     Telecommunications     Electric     Other Specify: \_\_\_\_\_

- Check here if you provided DEP with previous oral notification of this URAM. Date of Oral Notice: \_\_\_\_\_

- Check here if the property owner was NOT contacted prior to initiation of the URAM. If this is the case, you must attach an explanation of why the owner was not contacted, including the date and time when contact ultimately occurred.

- Check here if this URAM will occur in connection with the construction of new public utilities. If this is the case, document the nature and extent of encountered contamination, the scope and expense of necessary mitigation and the benefits and limitations of project alternatives.

With the exception stated below, the person undertaking the URAM must provide the name and license number of an LSP engaged or employed in connection with the URAM:

LSP Name: \_\_\_\_\_ LSP License Number: \_\_\_\_\_

LSP information is not required if the URAM is limited to the excavation and/or handling of not more than 100 cubic yards of soil contaminated by Oil, or not more than 20 cubic yards of soil contaminated either by a Hazardous Material or a mixture of a Hazardous Material and Oil.



RELEASE & UTILITY-RELATED ABATEMENT MEASURE (RAM & URAM) TRANSMITTAL FORM

Release Tracking Number

Pursuant to 310 CMR 40.0444 - 0446 and 310 CMR 40.0462 - 0465 (Subpart D)

4 - 13390

I. URAM COMPLETION STATEMENT:

Check here if this URAM was limited to the excavation and/or handling of not more than 100 cubic yards of soil contaminated by Oil, or not more than 20 cubic yards of soil contaminated by either a Hazardous Material or a mixture of a Hazardous Material and Oil.

If any Remediation Waste will be stored, treated, managed, recycled or reused at the site following submission of the URAM Completion Statement, you must submit either a Release Abatement Measure (RAM) Plan or a Phase IV Remedy Implementation Plan, along with the appropriate transmittal form, as an attachment to the URAM Completion Statement.

J. LSP OPINION:

I attest under the pains and penalties of perjury that I have personally examined and am familiar with this transmittal form, including any and all documents accompanying this submittal. In my professional opinion and judgment based upon application of (i) the standard of care in 309 CMR 4.02(1), (ii) the applicable provisions of 309 CMR 4.02(2) and (3), and (iii) the provisions of 309 CMR 4.03(5), to the best of my knowledge, information and belief,

> if Section B of this form indicates that a Release Abatement Measure Plan is being submitted, the response action(s) that is (are) the subject of this submittal (i) has (have) been developed in accordance with the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000, (ii) is (are) appropriate and reasonable to accomplish the purposes of such response action(s) as set forth in the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000 and (iii) complies(y) with the identified provisions of all orders, permits, and approvals identified in this submittal;

> if Section B of this form indicates that a Release Abatement Measure Status Report or a Utility-Related Abatement Measure Status Report is being submitted, the response action(s) that is (are) the subject of this submittal (i) is (are) being implemented in accordance with the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000, (ii) is (are) appropriate and reasonable to accomplish the purposes of such response action(s) as set forth in the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000 and (iii) complies(y) with the identified provisions of all orders, permits, and approvals identified in this submittal;

> if Section B of this form indicates that a Release Abatement Measure Completion Statement or a Utility-Related Abatement Measure Completion Statement is being submitted, the response action(s) that is (are) the subject of this submittal (i) has (have) been developed and implemented in accordance with the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000, (ii) is (are) appropriate and reasonable to accomplish the purposes of such response action(s) as set forth in the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000 and (iii) complies(y) with the identified provisions of all orders, permits, and approvals identified in this submittal;

I am aware that significant penalties may result, including, but not limited to, possible fines and imprisonment, if I submit information which I know to be false, inaccurate or materially incomplete.

Check here if the Response Action(s) on which this opinion is based, if any, are (were) subject to any order(s), permit(s) and/or approval(s) issued by DEP or EPA. If the box is checked, you MUST attach a statement identifying the applicable provisions thereof.

LSP Name: David G. Austin LSP #: 2062 Stamp:
Telephone: (617) 457-8250 Ext.:
FAX: (optional) (617) 457-8498
Signature: [Handwritten Signature]
Date: 9/22/98



An LSP Opinion is not required for a Utility-Related Abatement Measure Notification.

An LSP Opinion is not required for a URAM Completion Statement if the URAM is limited to the excavation and/or handling of not more than 100 cubic yards of soil contaminated by Oil, or not more than 20 cubic yards of soil contaminated either by Hazardous Material or a mixture of Hazardous Material and Oil.

K. PERSON UNDERTAKING RAM OR URAM:

Name of Organization: U.S. Department of the Navy
Name of Contact: David Barney Title: Environmental Engineer
Street: 1134 Main Street, P.O. Box 169
City/Town: South Weymouth State: MA ZIP Code: 02190
Phone: (781) 682-2771 Ext.: FAX: (optional)

Check here if there has been a change in person undertaking the RAM or URAM.



RELEASE & UTILITY-RELATED ABATEMENT MEASURE (RAM & URAM) TRANSMITTAL FORM

Pursuant to 310 CMR 40.0444 - 0446 and 310 CMR 40.0462 - 0465 (Subpart D)

Release Tracking Number

4 - 13390

RELATIONSHIP TO SITE OF PERSON UNDERTAKING RAM or URAM: (check one)

- RP or PRP Specify: [X] Owner [X] Operator [ ] Generator [ ] Transporter Other RP or PRP:
Fiduciary, Secured Lender or Municipality with Exempt Status (as defined by M.G.L. c. 21E, s. 2)
Agency or Public Utility on a Right of Way (as defined by M.G.L. c. 21E, s. 5(j))
Any Other Person Undertaking RAM or URAM Specify Relationship:

M. CERTIFICATION OF PERSON UNDERTAKING RAM OR URAM:

I, David Barney, attest under the pains and penalties of perjury (i) that I have personally examined and am familiar with the information contained in this submittal, including any and all documents accompanying this transmittal form, (ii) that, based on my inquiry of those individuals immediately responsible for obtaining the information, the material information contained in this submittal is, to the best of my knowledge and belief, true, accurate and complete, and (iii) that I am fully authorized to make this attestation on behalf of the entity legally responsible for this submittal.

By: [Signature] Title: Environmental Engineer
For: U.S. Department of the Navy Date: 9/23/98

Enter address of person providing certification, if different from address recorded in Section K:

Street:
City/Town: State: ZIP Code:
phone: Ext.: FAX: (optional)

YOU MUST COMPLETE ALL RELEVANT SECTIONS OF THIS FORM OR DEP MAY RETURN THE DOCUMENT AS INCOMPLETE. IF YOU SUBMIT AN INCOMPLETE FORM, YOU MAY BE PENALIZED FOR MISSING A REQUIRED DEADLINE.

**SURVEY REPORT**

for

**The Radiological Screening Survey on Nomans Land Island**

**RTN 4 - 13390**

---

**Submitted to:**

**Foster Wheeler Environmental Corporation  
4980 Corporate Drive  
Suite 140  
Huntsville, Alabama 35805**

**Mr. John C. McIlrath  
Project Manager**

**Submitted by:**

**Inter-Link Group Ltd.  
49 Bay Shore Drive  
Plymouth, Massachusetts 02360**

and

**Duke Engineering & Services Environmental Laboratory  
580 Main Street  
Bolton Massachusetts, 01740**

**September 2, 1998**

## Nomans Land Island Radiological Screening Survey

### EXECUTIVE SUMMARY

As part of a Release Abatement Measure (RAM), Foster Wheeler Environmental Corporation is in the final stages of locating and removing ordnance debris from the surface of the former U.S. Navy target range on Nomans Land Island. As part of their approval, the Massachusetts Department of Environmental Protection required that the ordnance debris recovered from the island clearance project be surveyed for the presence of depleted uranium (DU) prior to removal from the island.

During the period July 31, 1998 through August 31, 1998 a radiological screening survey was conducted on the ordnance debris and scrap metal collected from the surface of the entire island and located in the Nomans Land Island staging area. The radiological screening survey consisted of thirty four (34) in situ gamma-ray spectrometry measurements, using a high-purity germanium (HPGe) detector, supplemented with direct low level gamma measurements made in and around the ordnance debris staging area. The radiation measurements made in the Nomans Land Island staging area were then compared with six (6) reference background radiation measurements performed on Martha's Vineyard to determine if any elevated or unusual radiation levels that would be associated with DU, were present in the ordnance debris staging area.

No unusual or elevated levels of gamma radiation above the background levels measured on Martha's Vineyard were observed during the conduct of the Nomans Land Island radiological screening survey, and the debris was approved for off island transport.

# Nomans Land Island Radiological Screening Survey

## TABLE OF CONTENTS

	<u>Page</u>
Executive Summary .....	i
1.0 Introduction .....	1
2.0 Survey Instrumentation .....	2
3.0 Survey Method/Discussion .....	2
4.0 Data Interpretation .....	4
5.0 Reference Background Survey .....	5
6.0 Quality Assurance .....	6
7.0 Results and Conclusion .....	6
8.0 References .....	6

### **List of Figures**

Figure 1	In Situ Sensitivity to Pa-234m as Function of DU Mass & Distance from Detector Axis .....	7
Figure 2	Photos of Selected Survey Locations .....	8 - 9

### **Appendixes**

Appendix A	Measurement Locations for Nomans Land Island In Situ Gamm Spectrometry Survey
Appendix B	Referenced Background - Direct Gamma Exposure Rate Measurements on Martha's Vineyard
Appendix C	Direct Gamma Exposure Rate Measurements on Nomans Land Island Ordnance Debris

# Nomans Land Island Radiological Screening Survey

## TABLE OF CONTENTS (Cont.)

### **Appendixes**

Appendix D - 1	Pa-234m In Situ Analysis Summary - Reference Background
Appendix D - 2	Pa-234m Lab Analysis Summary - Reference Background
Appendix D - 3	Th-234 In Situ Analysis Summary - Reference Background
Appendix D - 4	Th-234 Lab Analysis Summary - Reference Background
Appendix E - 1	Pa-234m In Situ Summary - Nomans Land Island
Appendix E - 2	Th-234 In Situ Analysis Summary - Nomans Land Island
Appendix F	Instrument Calibration Certificate - Ludlum Serial No. 95474

**SURVEY REPORT**  
**for**  
**The Radiological Screening Survey on Nomans Land Island**

**1.0 INTRODUCTION**

Nomans Land Island is located in the Atlantic Ocean approximately 2.7 miles south of Gay Head on the island of Martha's Vineyard, Massachusetts. The U.S. Government used the Island as a military target range to train airplane pilots between 1943 and 1996. The military has designated the island as Restricted Area R-4105. In May 1996, target range operations ceased in preparation for the planned closure under Base Realignment and Closure and in accordance with agreements between the U.S. Navy and the U.S. Fish And Wildlife Service. The agreement designates the entire island as a National Wildlife Refuge.

At the request of the Massachusetts Department of Environmental Protection (MADEP), the Foster Wheeler Environmental Corporation has prepared a Release Abatement Measure (RAM) Plan on behalf of the U.S. Navy. Currently, Foster Wheeler is in the final stages of locating and removing ordnance debris from Nomans Land Island in accordance with the (RAM) Plan.

A search of historical information by the Navy has concluded that *No ammunition containing depleted uranium (DU) was used on Nomans Land Island. Cognizant authorities from the Navy's Radiological Affairs Support Office and the U.S. Air Force conclusively state that past activities at this practice range did not include the use of DU.* Notwithstanding the foregoing, MADEP required in the RAM Plan conditional approval letter that a radiological screening survey of the ordnance debris be conducted for the presence of DU prior to leaving the island. The Radiological Survey Plan was developed for DEP review prior to the work (a copy of the plan was submitted to the Gay Head Board of Selectmen).

During the period July 31, 1998 through August 31, 1998 a radiological screening survey was conducted on the ordnance debris and scrap metal located in the Nomans Land Island staging area. The debris was collected from the surface of the entire island as part of the RAM. The survey team consisted of personnel from Inter-Link Group Ltd. (ILG) and the Duke Engineering & Services Environmental Laboratory (DESEL). The radiological screening survey consisted of thirty four (34) in situ gamma-ray spectrometry measurements, using a high-purity germanium (HPGe) detector, supplemented with direct low level gamma measurements made with a Ludlum M-19 Micro R Meter in and around the ordnance debris staging area.

Gamma radiation measurements made in the Nomans Land Island staging area were then compared with six (6) reference background radiation measurements performed on Martha's Vineyard, to determine if any elevated or unusual radiation levels were present in the ordnance debris staging area.

## 2.0 SURVEY INSTRUMENTATION

The DESEL portable gamma spectrometry system is of modular design, comprised of a portable, high purity germanium (HPGe) photon detector with an integral preamplifier. The photon detector is a 40%, n-type germanium detector with a thin beryllium window, resulting in a virtually flat intrinsic energy response in the 30 to 100 keV energy range. The photon detector is interfaced to a portable multi-channel analyzer (MCA) system that includes the detector high voltage bias supply and spectroscopy amplifier. The MCA system is interfaced to a notebook personal computer (PC) with spectral data acquisition controlled by Windows based MCA emulation software.

In addition to the above instrumentation, a Ludlum Model M-19 Micro R Meter employing an externally mounted 1" x 1" NaI (TI) scintillator, was used to measure low-level gamma radiation.

## 3.0 SURVEY METHOD/DISCUSSION

In situ gamma spectroscopy is a non-destructive technique used to identify and quantify gamma and x-ray emitting radionuclides through analysis of photon energy spectra collected in the field. The technique is well established for the determination of gamma emitting isotopes in surface soils (reference 8-1 and 8-2). The technique has been specifically applied to the determination of uranium isotopes in surface soils in the vicinity of the Fernald Environmental Management Project (reference 8-4)

While  $^{238}\text{U}$  (4.468 x 10<sup>9</sup> year half-life) is an alpha emitter, its presence can be inferred from the measurement of its first two progeny,  $^{234}\text{Th}$  (24.1 day half-life and  $^{234\text{m}}\text{Pa}$  (1.17 minute half-life), which are gamma emitters. These nuclides would achieve 95% secular equilibrium in 105 days. The first progeny,  $^{234}\text{Th}$ , has gamma-ray emissions at 63.3 keV (3.8% abundance) and 92.6 keV (5.4% abundance) The second progeny,  $^{234\text{m}}\text{Pa}$ , has gamma-ray emissions at 766.4 (0.3% abundance) and 1001 keV (0.8% abundance). With the availability of large volume Ge detectors, ambient or environmental background levels of  $^{238}\text{U}$  progeny can be measured in reasonably short measurement times (e.g. 1 to 2 hours).

The intent of these measurements was to determine the presence of DU or DU

containing ordnance on Nomans Land Island. Measurements were performed in and around piles of ordnance and scrap metal collected from the surface of the entire island. Some of the scrap metal included large projectile target objects. Due to the irregular geometric shape of the scrap metal and ordnance debris piles, they were not modeled directly as source objects. Measurements were, instead performed in and around the debris piles and the ambient levels of  $^{238}\text{U}$  progeny in soil were quantified. Photos on pages 8 and 9 show how the detector was positioned relative to the ordnance debris. Measurements were made in front, between, behind and where possible above the debris. ( Refer to Appendix A for the measurement locations. ) Results of the in situ soil measurements performed in and around the debris piles were then compared to the background or baseline levels measured in Martha's Vineyard surface soil. Excess levels of  $^{238}\text{U}$  could then be attributed to either the debris piles or the surface soil.

In order to aid data interpretation, a sensitivity evaluation was performed to evaluate the HPGe detector sensitivity to DU as a function of radial distance from the detector as a function of  $^{238}\text{U}$  mass. The detector background response (e.g. 95% critical level count rate) at 1001 keV was determined for a typical 50-minute analysis. The detector response to DU cylindrical mass objects ranging in weight from 1 gram to 1 kilogram were calculated as a function of radial off-axis position. DU cylindrical source objects were assumed to lie on the ground plane. Results of the sensitivity evaluation are presented in Figure 1. The graph can be interpreted as follows; any calculated response rate greater than the 95% critical level count rate of 0.0092 counts per second will be detected by the detector. Example; the 1 kilogram DU mass can be detected at an off-axis distance of almost 14 meters (where it intersects the critical level count rate), while the 10 gram DU mass can only be detected at an off-axis distance of about 2 meters.

Quantitative spectral analysis is performed on-line by commercially available gamma spectroscopy software. Results are immediately available at the completion of the energy measurement data collection period. Peak search analysis of the energy spectra is performed for qualitative and quantitative identification of gamma emitters. Region-of-interest (ROI) based spectral determinations (e.g. Critical level and minimum detection level) are performed to demonstrate *a posteriori* detection sensitivities. A typical field sensitivity of 1.05 pCi/g for  $^{234}\text{Th}$  at 92 keV, and 0.88 pCi/g for  $^{234\text{m}}\text{Pa}$  at 1001 keV was achieved in a 50-minute count time, assuming a uniform source distribution.

Instrument calibrations are performed consistent with the methods described in reference 8-3. The system has been calibrated in the nominal energy range of 40 to 2400 keV energy range. The system is currently calibrated for uniform and exponentially distributed sources in the infinite soil half space.

Thirty four (34) gamma spectrum measurements were performed on Nomans Land

Island to determine if depleted uranium was present in the staged ordnance debris that was collected from the surface of the entire island. The measurements were performed in accordance with reference 8-1, using a HPGe detector coupled to a portable MCA and notebook computer. All gamma spectrometry measurements were performed with the HPGe detector end cap positioned nominally one (1) meter above the ground plane. Reported concentrations are based on a nominal 50-minute measurement performed on and around debris piles. The reported uncertainty represents the 1-sigma random counting statistics associated with the individual measurements.

The guidelines established for this survey were (1) any radiation measurement that indicated a significant increase above average background levels would be identified and (2) would require further evaluation. The guideline values for this survey were  $^{234}\text{Th}$  and  $^{234\text{m}}\text{Pa}$  measurements that exceed 2 to 3 times reference background concentrations.

All measurements and samples were analyzed for a complete gamma spectrum and the results reported in terms of picocuries per kilogram with a Minimum Detectable Activity (MDA).

The measurement of the ambient gamma radiation, using a Micro R Meter , positioned at one meter above the surface of the ground, was performed in and around the staging area to determine if elevated areas of gamma radiation were present.

#### 4.0 DATA INTERPRETATION

All measurement results are reported directly as calculated (as recommended in reference 8.5) and include the net concentration, the 1 sigma uncertainty in the net concentration, the minimum detectable concentration (MDC) and the critical level concentration (CLC). The 1 sigma uncertainty represents the uncertainty associated with the random counting statistics only. The critical level concentration is the minimum concentration level distinguishable from background at the 95% confidence level (e.g. only a 5% false positive probability or Type I error). Net concentration results greater than the CLC can be considered to be statistically significant with respect to background with only a 5% chance of false positive detection. The MDC is the minimum level that when present, will have a 95% probability of being detected at a level greater than the critical level (e.g. Only 5% false non-detection probability when activity is in fact present or Type II error). The MDC represents Type I (false positive) and Type II (false non-detection errors while the CLC includes only Type I error. The MDC and CLC values are after-the-fact or *a posteriori* estimates based on the actual sample measurements.

All reported results include parameters to relate detector response (counts) to

activity concentration including the absolute detector efficiency, photon abundance or decay scheme parameters, and counting live time. The absolute detector efficiency includes corrections for photon attenuation in soil and air, the solid angle of the soil half space geometry, and the angular response of the detector as a function of photon energy.

## 5.0 REFERENCE BACKGROUND SURVEY

Six (6) in situ gamma-ray spectrometry measurements were performed at selected locations on the western end of Martha's Vineyard. This data was used as reference background radiation data for the Nomans Land Island radiation measurements. Three areas selected for background measurements were located on sandy soil in the open field southeast of the Gay Head Light House. The remaining three background measurements were performed on the town owned Philbin Beach, located southeast of Gay Head. The background survey locations are as follows:

MV # 1	Gay Head Light - open field, 60 feet northeast of flag pole
MV # 2	Gay Head Light - open field, 100 feet east of flag pole
MV # 3	Gay Head Light - open field, 80 feet northwest of town structure
MV # 4	Philbin Beach - beach north of path to parking lot
MV # 5	Philbin Beach - Beach at tide line
MV # 6	Philbin Beach - Beach south of path to parking lot

The reference gamma emitting radionuclides for this DU survey were established as  $^{234}\text{Th}$  and  $^{234\text{m}}\text{Pa}$ . The maximum levels of  $^{234}\text{Th}$  and  $^{234\text{m}}\text{Pa}$  in the natural background as measured by in situ gamma-ray spectrometry on Martha's Vineyard, were  $^{234}\text{Th} = 0.86 \text{ pCi/g}$  (1 Sig =  $0.62 \text{ pCi/g}$ ) and  $^{234\text{m}}\text{Pa} = 1.27 \text{ pCi/g}$  (1 Sig =  $0.53 \text{ pCi/g}$ ). The Martha's Vineyard background survey results are reported in Appendix D - 1 and D - 3. The direct gamma exposure rate measurements taken at each background survey location indicated a range from 3 to 12  $\mu\text{R/hr}$ . The results of the direct gamma measurements are reported in Appendix B.

In addition to the background in situ measurements, six (6) soil samples or sand grab samples were collected in the general area of each gamma spectrum measurement. The soil samples were analyzed wet or "as is" for the presence of  $^{234}\text{Th}$  and  $^{234\text{m}}\text{Pa}$ , after mechanical mixing and blending. The soil sample analysis data supplement the in situ gamma spectrum data by providing precise information on the radionuclide concentrations in the soil, at the point of measurement. The results of the soil sample analysis are reported in Appendix D - 2 and D - 4.

The Town of Gay Head Selectmen Office was notified prior to commencing the background radiation measurements. Approval was obtained from the Selectmen Office to access Philbin Beach for the purpose of conducting background measurements.

## 6.0 QUALITY ASSURANCE

The HPGe detector was calibrated using a NIST-traceable Eu-152 point source. To verify proper operation of the HPGe detector in the field, the response to a mixed gamma check source was evaluated against a control chart prior to and at the end of each days measurements according to the requirements of reference 8- 2. The gamma check source included photon energies in the 60 to 1332 keV range.

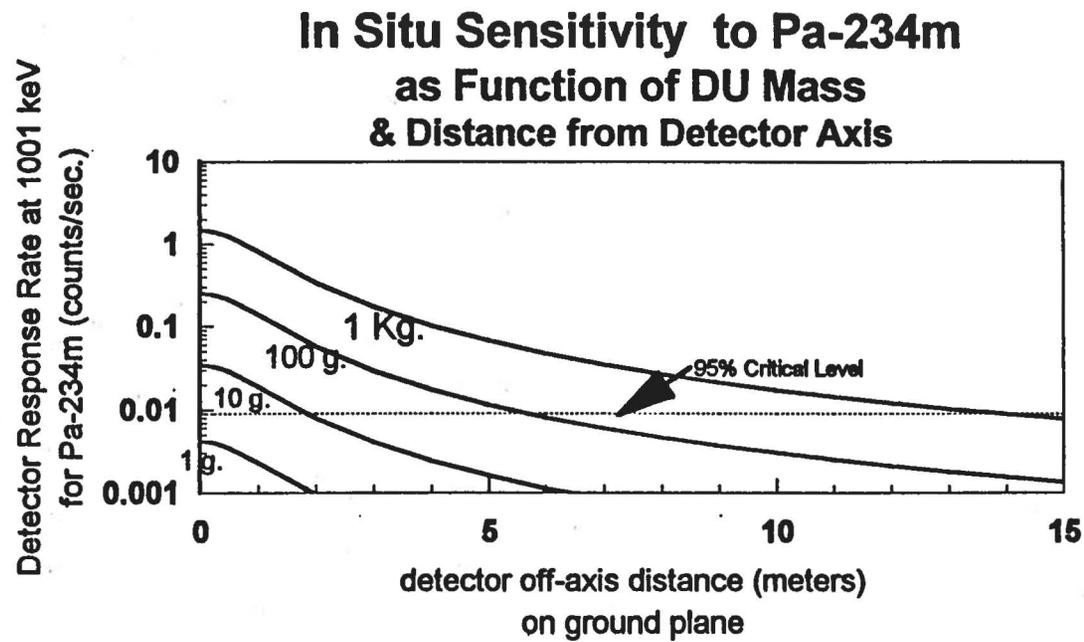
## 7.0 RESULTS AND CONCLUSION

The analysis of the survey data indicates that all 34 in situ gamma-ray spectrometry measurements made adjacent to the ordnance debris were within the  $^{234}\text{Th}$  and  $^{234\text{m}}\text{Pa}$  ranges established during the reference background radiation survey. The maximum levels measured were  $^{234}\text{Th} = 1.21 \text{ pCi/g}$  (1 Sig =  $0.46 \text{ pCi/g}$ ) and  $^{234\text{m}}\text{Pa} = 1.0 \text{ pCi/g}$  (1 Sig =  $0.44 \text{ pCi/g}$ ). The results are reported in Appendix D - 1 and D - 3. The micro-rem measurements also indicated only the expected ambient gamma background radiation levels. The gamma measurements are reported in Appendix C. No unusual or elevated levels of gamma radiation that would be associated with DU were observed during the conduct of the Nomans Land Island radiological screening survey.

## 8.0 REFERENCES

- 8-1 DE&S Procedure 510, Revision 8, *Identification and Quantitative Determination of Radionuclides in Soil by Gamma Ray In Situ Spectrometry.*
- 8-2 DE&S Procedure 710, Revision 15, *Quality Control of Laboratory Instrumentation.*
- 8-3 HASL-300, *Environmental Measurements Laboratory Procedures Manual* (formerly Health & Safety Lab), 27<sup>th</sup> Edition, Volume 1, revised February 1992.
- 8-4 Miller, K.M., Shebell, P., and Klemic, G.A., *In Situ Gamma-Ray Spectrometry for the Measurement of Uranium in Surface Soils,* Health Physics, August 1998, Vol. 67-2.
- 8-5 *Upgrading Environmental Radiation Data,* Health Physics Society Committee Report, HPSR- 1, August 1980.

Figure 1



**FIGURE 2**

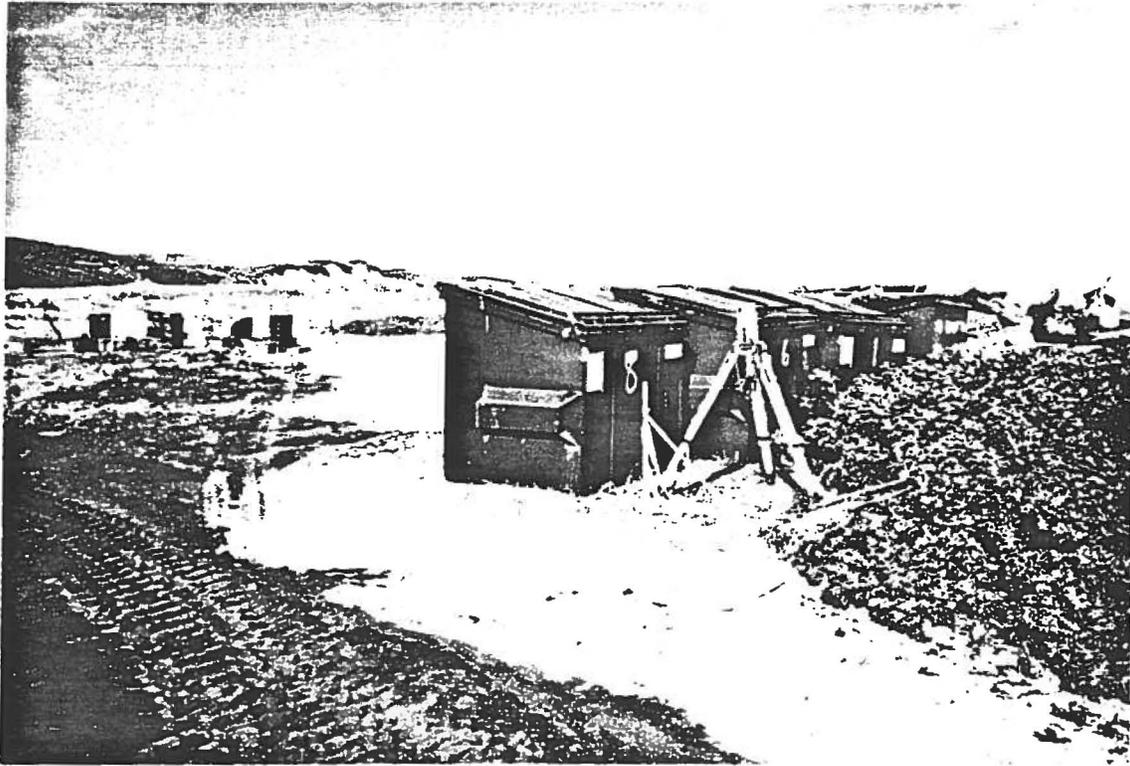


**Photo of Survey Location (NI-7) Pile # 4 -Steel Scrap**



**Photo of Survey Location (NI-9) Bomb Pallets**

**FIGURE 2**



**Photo of Survey Location (NI-24) Steel Box # 8**



**Photo of Survey Location (NI-18) Debris Sorting Area**

**APPENDIX A**

**Measurement Locations  
for  
Nomans Land Island In Situ Gamma Spectrometry Survey**

<b>Location #</b>	<b>Survey Location</b>	<b>Comment</b>
NI-1	Northwest of Pile #1 orange practice bombs	MK-106 bombs
NI-2	North of Pile #2	Aluminum scrap
NI-3	Between Piles 1 and 2	
NI-4	On top of dune looking down on pile #2	
NI-5	North side of Pile # 4	Steel scrap
NI-6	Between Pile #3 and #4	Pile #3 - Jet engine debris
NI-7	West side of Pile #4	
NI-8	On dune looking down on Pile #4	
NI-9	In center of bomb staging area	Bombs on pallets
NI-10	South side of bomb staging area	
NI-11	Center of concrete practice bomb staging area	
NI-12	East side of mooring bouy targets	Adjacent steel tank
NI-13	Between target bouys	
NI-14	West side target bouys	
NI-15	Steel Box #7	Aluminum
NI-16	Steel Box #1	
NI-17	Over 30 and 40 caliber rounds buckets	In sorting area
NI-18	Next to sorting table	
NI-19	East end of sorting area	
NI-20	Sorting area in front of steel boxes	Boxes 7, 1, 6 and 8
NI-21	Sorting area in front of steel boxes	Boxes 5, 4, 2 and 3
NI-22	Sorting area near wood pile	

## APPENDIX A

### Measurement Locations for Nomans Land Island In Situ Gamma Spectrometry Survey

Location #	Survey Location	Comment
NI-23	Emergency Helicopter Landing area	Long count
NI-24	Steel Box # 8	
NI-25	Steel Box # 6	
NI-26	Steel Box # 5	
NI-27	Steel Box # 4	
NI-28	Steel Box # 2	
NI-29	Steel Box # 3	
NI-30	Staging area beach	Near "Restricted" sign
NI-31	Inert Debris Pile in Staging Area	Small practice bombs
NI-32	500 lbs. Bomb Pile - West Side-Staging area	Center of pile
NI-33	500 lbs. Bombs on pallets on beach	East end
NI-34	500 lbs. Bombs on pallets on beach	West end

**APPENDIX B**

**Reference Background  
Direct Gamma Exposure Rate Measurements  
on  
Martha's Vineyard**

**Instrument: Ludlum Model 19 Micro Rem Meter  
Serial # 95474  
Calibration Date: 7/28/98**

<b>Location</b>	<b>Gamma uR/hr @ 1 Meter</b>
<b>Gay Head Flag Pole Area - MV # 1</b>	<b>6 - 8</b>
<b>Gay Head Flag Pole Area - MV # 2</b>	<b>6 - 9</b>
<b>Gay Head Flag Pole Area - MV # 3</b>	<b>7 - 9</b>
<b>Philbin Beach Parking Lot</b>	<b>3 - 5</b>
<b>Philbin Beach -Trail from Parking Lot to Beach</b>	<b>3 - 5</b>
<b>Philbin Beach - MV # 4</b>	<b>3 - 4</b>
<b>Philbin Beach - Rocky Area at Tide Line</b>	<b>10 - 12</b>
<b>Philbin Beach - MV # 5</b>	<b>7 - 9</b>
<b>Philbin Beach - MV # 6</b>	<b>3 - 4</b>

## APPENDIX C

### Direct Gamma Exposure Rate Measurements on Nomans Land Island Ordnance Debris

Instrument: Ludlum Model 19 Micro Rem Meter  
 Serial # 95474  
 Calibration Date: 7/28/98

Location	No. Measurements	Gamma uR/hr @ 1 Meter
Orange MK - 106 Practice Bomb Pile (Pile # 1)	15	3.5 - 5.0
Aluminum Scrap Pile (Pile # 2)	21	3.5 - 5.5
Jet Engine & Steel Scrap (Pile # 3)	14	3.5 - 5.0
Steel Scrap Pile (Pile # 4)	26	3.5 - 7.0
Steel Bomb Casings on Pallets and Concrete Debris	36	3.5 - 6.0
Steel Tank by Target Bouys	9	3.5
Target Bouys	29	2.0 - 3.5
Small Caliber Rounds Buckets & Sorting Area	8	3.5 - 4.0
Steel Box # 8	10	4.5
Steel Box # 6	10	4.5
Steel Box # 7	10	3.5 - 4.5
Steel Box # 1	10	3.5 - 4.5
Steel Box # 5	10	2.5 - 3.5
Steel Box # 4	10	2.5 - 3.5
Steel Box # 2	10	2.5 - 3.5
Steel Box # 3	10	2.5 - 3.5
Inert Debris Pile in Staging Area	10	3.5 - 4.5
500 lbs. Bomb Pile - West Side of Staging Area	12	4.5 - 5.0
500 lbs Bombs on Pallets - Beach /East End	10	2.5 - 3.5
500 lbs Bombs on Pallets - Beach/West End	10	2.4 - 4.0

APPENDIX D.1

Pa-234m In Situ Analysis Summary  
- Reference Background -

ID	Net Concentration (pCi/Kg)	1Sigma (pCi/Kg)	MDC (pCi/Kg)	CLC (pCi/Kg)	Net > CLC
MV-1	1277	491.2	1140	540.2	Yes
MV-2	236.6	387.2	1013	476.6	
MV-3	143.1	406.2	1068	504	
MV-4	709.8	325	812.2	376.3	Yes
MV-5	302.6	532.6	1377	658.9	
MV-6	726.3	527.4	1159	549.6	Yes
Mean:	565.9	444.9	1094.9	517.6	
SDev:	426.3	84.7	186.1	93.1	
SDev:	75.3%	19.0%	17.0%	18.0%	
Min:	143.1	325.0	812.2	376.3	
Max:	1277.0	532.6	1377.0	658.9	

APPENDIX D.2

Pa-234m Lab Analysis Summary  
- Reference Background -

ID	Net Concentration (pCi/Kg)	1Sigma (pCi/Kg)	MDC (pCi/Kg)	CLC (pCi/Kg)	Net > CLC
MV-1	198	179	591	289.1	
MV-2	678	174	624	308.2	Yes
MV-3	620	160	565	277.7	Yes
MV-4	-197	147	514	250.4	
MV-5	45.1	157	539	261.6	
MV-6	4.32	174	620	306.7	
Mean:	224.7	165.2	575.5	282.3	
SDev:	352.5	12.4	44.3	23.6	
SDev:	156.8%	7.5%	7.7%	8.4%	
Min:	-197.0	147.0	514.0	250.4	
Max:	678.0	179.0	624.0	308.2	

APPENDIX D.3

Th-234 In Situ Analysis Summary  
- Reference Background -

ID	Net Concentration (pCi/Kg)	1Sigma (pCi/Kg)	MDC (pCi/Kg)	CLC (pCi/Kg)	Net > CLC
MV-1	-212.6	612.2	1584	786.2	
MV-2	256.8	623.6	1609	798.8	
MV-3	860.2	626.9	1612	800.3	Yes
MV-4	48.5	435.6	1129	558.8	
MV-5	840.3	551.8	1419	703.6	Yes
MV-6	848.8	461.5	1186	587.1	Yes
Mean:	440.3	551.9	1423.2	705.8	
SDev:	472.6	85.0	218.6	109.3	
SDev:	107.3%	15.4%	15.4%	15.5%	
Min:	-212.6	435.6	1129.0	558.8	
Max:	860.2	626.9	1612.0	800.3	

APPENDIX D.4

Th-234 Lab Analysis Summary  
- Reference Background -

ID	Net Concentration (pCi/Kg)	1Sigma (pCi/Kg)	MDC (pCi/Kg)	CLC (pCi/Kg)	Net > CLC
MV-1	452	70.6	341	176.9	Yes
MV-2	1010	30.9	114	53.7	Yes
MV-3	605	69.9	327	166.9	Yes
MV-4	123	20.9	80.7	40.4	Yes
MV-5	9.76	22.1	78.5	39.3	
MV-6	2.76	19.1	69.5	34.8	
Mean:	367.1	38.9	168.5	85.3	
SDev:	399.3	24.6	129.2	67.4	
SDev:	108.8%	63.2%	76.7%	79.1%	
Min:	2.8	19.1	69.5	34.8	
Max:	1010.0	70.6	341.0	176.9	

APPENDIX E.1

Pa-234m In Situ Analysis Summary  
- Nomans Land Island -

ID	Net Concentration (pCi/Kg)	1Sigma (pCi/Kg)	MDC (pCi/Kg)	CLC (pCi/Kg)	Net > CLC
NI-1	-156.8	335.9	915.8	427.6	
NI-2	594.3	440.5	1125	532.8	Yes
NI-3	440.2	338.1	870.7	405.6	Yes
NI-4	550.3	322.5	820.1	380.3	Yes
NI-5	104.5	406	1070	505	
NI-6	1001	437.7	1091	515.7	Yes
NI-7	649.3	350.4	885.3	412.9	Yes
NI-8	247.6	365.5	956.9	448.7	
NI-9	-82.54	301.2	822.7	381.6	
NI-10	143.1	322.5	855.9	398.2	
NI-11	363.2	362.9	941.3	440.9	
NI-12	132.1	316.1	840.8	390.6	
NI-13	66.03	297.1	798.9	369.7	
NI-14	577.8	316	1031	485.5	Yes
NI-15	297.1	339.1	885.3	412.9	
NI-16	-313.6	339	934.5	437.5	
NI-17	335.7	339.4	882.9	411.7	
NI-18	401.7	386.9	1000	470.3	
NI-19	649.3	391	1284	612.4	Yes
NI-20	-176.1	372.7	1007	473.5	
NI-21	660.3	310.3	777	358.7	Yes
NI-22	363.2	348.6	904.4	422.4	
NI-23	406.9	166.4	388.9	189.8	Yes
NI-24	396.2	399.7	1039	483.6	
NI-25	422.6	351.9	912.1	420.3	Yes
NI-26	449	320.2	826.1	377.3	Yes
NI-27	-46.22	306.7	844.8	386.7	
NI-28	79.24	310.6	841.1	384.8	
NI-29	482	334.2	859.5	394	Yes
NI-30	-44.31	229.4	609.6	290.7	
NI-31	434.7	366	943.5	442	
NI-32	159.6	336.9	1151	545.6	
NI-33	38.52	295	796.2	368.3	
NI-34	-324.7	296.6	833.1	386.8	
Mean:	273.6	336.9	885.0	412.9	
SDev:	305.9	52.2	164.8	78.5	
SDev:	111.8%	15.5%	18.6%	19.0%	
Min:	-324.7	166.4	388.9	189.8	
Max:	1001.0	440.5	1284.0	612.4	

APPENDIX E.2

Th-234 In Situ Analysis Summary  
- Nomans Land Island -

ID	Net Concentration (pCi/Kg)	1Sigma (pCi/Kg)	MDC (pCi/Kg)	CLC (pCi/Kg)	Net > CLC
NI-1	743.5	408.1	1049	518.7	Yes
NI-2	684.8	461.6	1188	588.3	Yes
NI-3	161.2	389.5	1009	498.9	
NI-4	1167	434	1111	549.7	Yes
NI-5	895.9	440.9	1132	560.2	Yes
NI-6	465.1	445.5	1149	568.8	
NI-7	492.2	371.1	957.3	472.9	Yes
NI-8	253.9	436.3	1128	558.3	
NI-9	686.2	384	987.7	488	Yes
NI-10	486.5	416.8	1075	531.7	
NI-11	-145.5	414.7	1078	533.3	
NI-12	540.7	394.1	1016	502.1	Yes
NI-13	226.8	374.8	970.8	479.6	
NI-14	526.4	411.1	1060	524.2	Yes
NI-15	388	402.5	1040	514	
NI-16	-61.34	413.7	1075	531.5	
NI-17	276.8	417.7	1080	534.3	
NI-18	564.9	432.1	1114	551.1	Yes
NI-19	569.2	464.7	1198	593	
NI-20	-184	451.6	1173	580.7	
NI-21	1217	423.2	1082	535.3	Yes
NI-22	828.8	446.2	1147	567.5	Yes
NI-23	310.8	166.9	442	220.1	Yes
NI-24	655.7	469	1207	596.7	Yes
NI-25	49.64	441.4	1145	565.7	
NI-26	529	413.6	1066	526.3	Yes
NI-27	75.32	410.5	1066	526	
NI-28	59.92	406	1055	520.3	
NI-29	1.713	411.3	1069	527.6	
NI-30	171.6	281.2	730.4	362.5	
NI-31	370.9	445.9	1152	570	
NI-32	189.7	441.9	1462	725.4	
NI-33	206.9	368.9	955.9	472.2	
NI-34	81.31	359	932.4	460.4	
Mean:	396.7	407.3	1061.8	525.2	
SDev:	343.0	56.1	158.2	78.3	
SDev:	86.5%	13.8%	14.9%	14.9%	
Min:	-184.0	166.9	442.0	220.1	
Max:	1217.0	469.0	1462.0	725.4	



NUCLEAR INSTRUMENT CO.

APPENDIX F

Reg. No. 14082-1

Calibration Certificate

Customer Interlink Group, Instrument Mfg. Ludlum, Instrument Mod. 19, Serial No. 95474/04380, Cal. Date 7-28-98, Det. Mfg., Det. Type NAI / SCINT., Serial No.

Table with 5 columns: Calibration source(s), Radium 226 A, Radium 226 B, Radium 226 C, Cesium 137 D, Cesium 137 E. Rows include Quantity, Mfgs. No., NIST/NBS Traceable No., and Date.

Main calibration table with 5 columns: Calculated Exposure Rate, Meter Reading (\*), Range Maximum, Calibration Source (s), Correction Factor (C. F.). Includes handwritten data for various exposure rates and source E.

Detector center axis parallel [ ] perpendicular [x] to radiation field. Beta Shield: Open [ ] Closed [ ]
Electronic Alignment [ ] Temperature [ ] °F Barometric Pressure [ ] Humidity [ ] % R.H.
Instrument check source: Scale: [ ] Reading: [ ]

Remarks: \*Meter readings are background corrected. Model M-500, S.N. 54679 pulse generator was used for inter-range linearity and calibration checks.

This instrument has been calibrated using procedures recommended by the U. S. Nuclear Regulatory Commission.

Calibrated by Carl J. Bosconi MA. REGISTRATION #65-0134

44 Camelot Drive • Plymouth, MA 02360 • Telephone: (508) 747-4549

NUCLEAR / radiation detection products / instrument services / accessories / supplies