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TECHNICAL MEMORANDUM FOR EXPANDED SITE INSPECTION RESULTS FOR MORTAR IMPACT AREA DAM NECK ANNEX NAS OCEANA VA

11/5/2012

CH2MHILL

Declaration

Site Name and Location

Mortar Impact Area
Naval Air Station (NAS) Oceana Dam Neck Annex
Virginia Beach, Virginia

Statement of Basis and Purpose

This Statement of Basis and Purpose and stakeholder signatures documents the conclusion that no further action (NFA) is necessary to ensure protection of human health and the environment at the Mortar Impact Area at NAS Oceana – Dam Neck Annex in Virginia Beach, Virginia. This determination has been made in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986, and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan. This decision is based on the Expanded Site Inspection Results Technical Memorandum and information contained in the Administrative Record for the site. The Navy, in partnership with the Virginia Department of Environmental Quality, concurs with the NFA determination.

Rationale for No Further Action Determination

Based on the results of the Site Inspection, no potentially unacceptable human health or ecological risks and no CERCLA releases were identified at the Mortar Impact Area. Because there are no hazardous substances, pollutants, or contaminants remaining onsite above levels that prevent unlimited use and unrestricted exposure, no further action is necessary for the site to protect human health and the environment.

Authorizing Signatures

Krista Parra — 1/10/13

Krista Parra
Remedial Project Manager
Naval Facilities Engineering Command
Mid-Atlantic

Date

Stephen Mihalko — 1-10-13

Stephen Mihalko
Remedial Project Manager
Virginia Department of Environmental Quality

Date

Expanded Site Inspection Results for the Mortar Impact Area Dam Neck Annex - Naval Air Station Oceana, Virginia

PREPARED FOR: Naval Facilities Engineering Command, Mid-Atlantic

PREPARED BY: CH2M HILL

DATE: November 5, 2012

This Technical Memorandum (TM) summarizes the Expanded Site Inspection (SI) activities for the Mortar Impact Area (MIA) at Dam Neck Annex of Naval Air Station (NAS) Oceana in Virginia Beach, Virginia. These SI activities were performed under the Naval Facilities Engineering Command Atlantic Comprehensive Long-term Environmental Action—Navy (CLEAN) Program, Contract Number N62470-08-D-1000, Contract Task Order WE03.

This TM is organized as follows:

Section 1, Introduction and Site Background: Provides the overall format of the TM, a brief description of NAS Oceana and Dam Neck Annex, and chronology of SI events.

Section 2, Expanded Site Inspection Results: Provides a detailed description of the Expanded SI and data collection activities and summarizes the results of the Expanded SI activities performed.

Section 3, References: Lists the documents used in preparation of this TM.

Tables, figures, and attachments are provided at the end of this TM.

1 Site Background

NAS Oceana is located along the Atlantic Ocean, within the southeastern portion of the city of Virginia Beach, Virginia **(Figure 1)**. Dam Neck Annex is located approximately 5 miles southeast of NAS Oceana, in Virginia Beach, Virginia (**Figure 1**). The MIA is a Munitions Response Site (MRS) located in the southeastern portion of Dam Neck Annex (**Figure 2**). The historical range boundary overlaps a portion of another MRS, the Moving Target/Mortar Range – South (MTMR-S).

A chronology of SI events is presented below.

Date	SI Activity
March 2010	Submit Draft Final Geophysical Investigation Plan
March 2010	Conduct Digital Geophysical Mapping (DGM) at the MTMR-S and MIA
February 2011	Submit Final SI Report for the MTMR-S, MIA, and MTMR-North
October 2011	Submit Final Explosives Safety Submission (ESS) for intrusive investigation at the MTMR-S and MIA
January 2012	Receive Department of Defense Explosives Safety Board Acceptance of ESS
May 2012	Submit Technical Management Plan, Munitions and Explosives of Concern Quality Assurance Project Plan and Tier II Sampling and Analysis Plan for expanded SI at the MTMR-S and MIA
June 2012	Conduct intrusive investigation at the MTMR-S and MIA as part of the expanded site inspection

Additional MIA background information, including site history, geology, hydrogeology, habitats and biota, and previous investigations, is presented in the *Draft Tier II Sampling and Analysis Plan, Dam Neck Annex Mortar Ranges (Moving Target/Mortar Range–South and Mortar Impact Area), Expanded Site Inspection, Naval Air Station Oceana, Virginia Beach, Virginia* ((Tier II UFP-SAP)*;* CH2M HILL, 2012a).

2 Expanded Site Inspection Results

2.1 Investigation Activities

The field investigation activities for the expanded site inspection were conducted in June 2012. Investigation activities followed the protocols and standard operating procedures (SOPs) described in the following documents:

- *Technical Management Plan (TMP), Expanded Site Inspection for Dam Neck Annex: Moving Target/Mortar Range–South and Mortar Impact Area* (CH2M HILL, 2012b). Also included in the Technical Management Plan (TMP) as appendices are the following reports:
  - *Munitions and Explosives of Concern, Quality Assurance Project Plan* (MEC-QAPP) *for Expanded Site Inspection for Dam Neck Annex: Moving Target/Mortar Range–South and Mortar Impact Area* (CH2M HILL, 2012c)
  - Tier II UFP-SAP (CH2M HILL, 2012a)
  - Site-specific Health and Safety Plan (HASP)
- *Explosives Safety Submission (ESS) for Dam Neck Annex, Moving Target / Mortar Range–South and Mortar Impact Area, Naval Air Station Oceana, Virginia Beach, Virginia.* (CH2M HILL, 2011a)

Expanded SI activities are discussed in the following sections. Expanded SI activities were also conducted at MTMR-S and the results, recommending further action, will be presented in a separate TM.

2.2 DGM Survey and Intrusive Investigation Field Activities

As part of the SI, a limited DGM survey was completed at MIA in March 2010 using an EM61 -MK2 metal detector coupled with a real time kinematic (RTK) global positioning system (GPS) (CH2M HILL, 2010). The DGM survey identified the presence of 705 geophysical anomalies within the MRS which includes portions of the MIA and MTMR-S **(Figure 3)** (NAEVA, 2011). Ninety of the anomalies located in the MIA were determined by their amplitude and footprint to be the most likely to represent 60mm or 81mm mortars in the top two feet[1] and were thus identified as "Priority 1"**.** This identification does not preclude that these anomalies all represent munitions in the subsurface, nor that the other identified anomalies (classified as Priority 2 and Priority 3) do not represent munitions, but rather directed intrusive investigations first to those anomalies that were most likely to be caused by munitions.

The TMP and **Table 1** present a summary of the definable features of work performed during the Expanded SI. The MEC-QAPP (Appendix A of the TMP) and Tier II UFP-SAP (Appendix B of the TMP) present the detailed approach, methods, operational procedures, and quality control requirements associated with intrusive investigation activities.

Intrusive investigation activities were conducted on June 4 through June 6, 2012. NAEVA Geophysics of Charlottesville, Virginia, was subcontracted to re-acquire the position of the geophysical anomalies previously identified, using RTK GPS; and USA Environmental of Oldsmar, Florida, was subcontracted to provide unexploded ordnance (UXO) technicians to excavate the selected anomalies. The description and disposition of Priority 1 anomalies excavated during intrusive activities is presented in **Table 2**. No MEC items, only cultural debris items, were discovered in the MIA during the intrusive investigation; therefore further investigation is not warranted at the site. Photographs of the cultural debris items removed during intrusive activities are presented in **Attachment A**.

2.3 Soil Sampling Field Activities

Because the MIA was reportedly used as a mortar range in the 1950s, the presence of munitions constituents (MC) associated with MEC was suspected. The collection of soil samples for MEC-related MC was planned for in the event

[1] Prioritization was based on the documented responses for these items (at their worst orientation) in "EM61-MK2 Response of Standard Munitions Items" (Naval Research Laboratory, 2008).

that MEC was found. Since no MEC items were found during the intrusive investigation, no soil sampling was necessary.

2.4 Historical Aerial Photography Analysis

The MIA was identified on an archival schematic dated 1950. The source of the schematic (shown below) is the Foreign Affairs Defense and Trade Select Committee (FADTC) and as the title indicates it is a proposed station layout schematic for the Mortar Impact Area, Rifle Range, and Pistol Range at Dam Neck, Virginia. (Malcolm Pirnie, 2008)

Aerial photographic analysis conducted on aerial maps from 1942, 1945, 1951, 1955, 1958, 1962, and 1964 did not show any evidence of this range (ERI, 2011). Two representative aerial maps (1950 and 1964) are presented in **Attachment B**.

FIGURE 4
1950 FADTC Dam Neck Proposed Station Layout Schematic, Dam Neck, Virginia showing Mortar Impact Area, Rifle Range, and Pistol Range

2.5 Recommendations

Based on the results of the findings of the historical aerial photography analysis indicating the site never existed, and that no munition related items were found during the intrusive investigation, no further action is recommended for this site.

3 References

CH2M HILL, 2012a. *Draft Tier II Sampling and Analysis Plan, Dam Neck Annex Mortar Ranges (Moving Target Mortar Range – South and Mortar Impact Area), Expanded Site Inspection, Naval Air Station Oceana, Virginia Beach, Virginia*. May.

CH2M HILL, 2012b. *Technical Management Plan, Expanded Site Inspection for Dam Neck Annex: Moving Target/Mortar Range–South and Mortar Impact Area, Naval Air Station Oceana, Virginia Beach, Virginia.* May.

CH2M HILL, 2012c. *Munitions and Explosives of Concern, Quality Assurance Project Plan for Expanded Site Inspection for Dam Neck Annex: Moving Target/Mortar Range–South and Mortar Impact Area.* May.

NAEVA, 2011. *Geophysical Investigation Report, Fleet Combat Training Center, Dam Neck Annex, Virginia Beach, Virginia*. January.

CH2M HILL 2011a. *Final Explosives Safety Submission for Dam Neck Annex, Moving Target / Mortar Range – South and Mortar Impact Area Naval Air Station Oceana, Virginia Beach, Virginia.* October.

CH2M HILL 2010. *Draft Final Geophysical Investigation Plan, Site Inspection Munitions Response Program, Fleet Combat Training Center, Dam Neck Annex, Naval Air Station Oceana, Virginia Beach, Virginia.* March.

Malcolm Pirnie. 2008. *Final Preliminary Assessment Naval Air Station Oceana, Dam Neck Annex, and Naval Auxiliary Landing Field Fentress, Virginia*, *Naval Facilities Engineering Command Atlantic*.

Naval Research Laboratory, 2008. "EM61-MK2 Response of Standard Munitions Items" NRL/MR/611--0-08-9155, Washington, D.C.

Tables

TABLE 1
Definable Features of Work and Supporting Documents
Expanded Site Inspection

Mortar Impact Area
Dam Neck Annex - Naval Air Station Oceana
Virginia Beach, Virginia

Definable Feature of Work	Description	Supporting Document(s)
Pre-Mobilization Activities	Develop and obtain approval of the Work Plan. Set up geographic information system (GIS) and data management tools and procedures. Procure subcontractors. Hold Pre-construction meeting.	HASP, MEC-QAPP
Mobilization/Site Preparation	Mobilize Crew and Equipment. Perform an onsite document review. Establish communications and logistics. Establish site boundary. Perform site-specific training.	MEC-QAPP
Anomaly Reacquisition	Reacquire all of geophysical anomalies identified as representing potential subsurface MEC during the March 2010 DGM investigation.	MEC-QAPP, EPP
Intrusive investigation of DGM identified anomalies	Execute manual digging to identify the source of individual anomalies following reacquisition of each anomaly.	MEC-QAPP, EPP
Anomaly Removal Verification	Perform anomaly removal verification and excavation backfilling.	MEC-QAPP, ESS
Demilitarization of MEC/material documented as an explosive hazard (MDEH)	Perform demilitarization of all MEC and MDEH	MEC-QAPP, ESS, EPP
Disposition of material documented as safe (MDAS)	Recycle MDAS	MEC-QAPP, ESS
MC Soil Sampling	Conduct environmental sampling for MC at locations where MEC is identified Collect and analyze environmental samples to evaluate potential risks to human and/or ecological receptors	Tier II UFP-SAP
Demobilization	Demobilize crew and equipment	MEC-QAPP
Final Report and Closeout	Prepare an After Action Report to document the MEC intrusive investigation Prepare an expanded SI Report summarizing the results from intrusive investigations, sampling events, and Ecological Risk Screenings (ERSs) and Human Health Risk Screenings (HHRSs), and recommending future actions	MEC-QAPP

TABLE 2

Priority 1 Anomalies

Expanded Site Inspection Results

Mortar Impact Area

Dam Neck Annex - Naval Air Station Oceana - Virginia Beach, Virginia

Target ID	X UTM Coordinate	Y UTM Coordinate	Signal Amplitude[1] (mV)	Item Description/Depth Found
2_031	415028.0	4069048.8	147	small concrete with pipe/6" deep
2_040	414913.5	4069123.6	118	scrap metal/3" deep
2_010	415048.0	4069041.0	421	rebar 12" long & elec conduit/surface (too long left in ground)
2_174	414985.8	4069061.8	21	angle iron/6" deep
2_035	415057.8	4069035.8	132	conduit 2 pieces/10" deep
2_009	415021.6	4069057.4	506	1" pipe 6' long/1' deep
2_032	414905.6	4069132.2	137	wire/48" deep
2_029	414999.1	4069043.1	150	long piece of pipe (too long left in ground)
2_026	415054.8	4069042.4	164	electrical junction box/6" deep
2_051	414972.2	4069074.4	80	large piece of rebar/6" deep (too long left in ground)
2_234	414996.8	4069241.2	13	not found
2_048	414943.8	4069104.8	91	angle iron/6" deep
2_045	415015.4	4069049.4	105	18" long rebar/4" deep
2_036	414941.2	4069160.4	127	under asphalt/no dig
2_042	415024.0	4069052.2	114	3" bolt
2_052	415005.6	4069046.2	80	3" dia pipe (too long left in ground)
2_210	415042.1	4069039.8	16	small piece of wire/1" deep
2_041	415036.6	4069016.0	116	2' long rod/3" deep
2_044	414907.8	4069134.0	106	under asphalt/no dig
2_231	414994.0	4069038.8	13	under asphalt/no dig
2_237	415067.0	4068982.8	12	wire/3" deep (left in ground)
2_014	414987.6	4069062.0	286	bench mark/6" deep (left in ground)
2_292	414994.0	4069041.2	9	under asphalt/no dig
2_131	414978.8	4069235.8	33	not found
2_267	414949.6	4069171.4	10	large piece of metal24" deep left in ground
2_142	414973.1	4069070.7	29	under asphalt/no dig
2_141	415053.0	4069045.0	29	piece of wire/1" deep
2_149	414984.8	4069058.6	27	nail/3" deep
2_127	414974.2	4069070.6	33	small arms link/1" deep
2_355	414987.3	4069052.1	6	under asphalt/no dig
2_125	414913.9	4069136.9	34	8" long pipe/3" deep
2_117	415015.8	4069072.8	37	rebar/1" deep
2_137	414987.2	4069057.2	30	under asphalt/no dig
2_135	415053.4	4069040.8	31	rebar 18" deep
2_133	415006.0	4069052.3	32	2" pipe/14" deep (too long left in ground)
2_298	415009.0	4069213.2	8	not found
2_108	414947.0	4069102.2	39	sheet metal/12" deep
2_226	415048.0	4069083.6	14	piece of wire/4" deep
2_122	414994.6	4069033.0	35	hot rocks next to rod/4" deep
2_326	415056.8	4069030.2	7	piece of wire/surface
2_213	414944.0	4069162.1	15	rod/2" deep
2_185	414985.5	4069060.7	19	AA battery/1" deep
2_184	414998.4	4069240.6	19	6"x4"x2" metal scrap/2' deep
2_177	414995.2	4069250.0	21	cable (too long left in ground)
2_170	415032.0	4069055.2	22	7" long piece wire 4" deep
2_196	414986.8	4069059.4	18	3' long scrap metal/4" deep

TABLE 2

Priority 1 Anomalies

Expanded Site Inspection Results

Mortar Impact Area

Dam Neck Annex - Naval Air Station Oceana - Virginia Beach, Virginia

Target ID	X UTM Coordinate	Y UTM Coordinate	Signal Amplitude[1] (mV)	Item Description/Depth Found
2_316	414986.2	4069053.2	7	under asphalt/no dig
2_163	414945.4	4069103.4	24	pipe/14" deep
2_159	414924.5	4069141.4	25	large metal plate/3" deep (too long left in ground)
2_205	415036.4	4069076.6	16	telephone pole with bolts (too long left in ground)
2_104	415057.6	4069041.4	40	rebar 18" long 12" deep
2_248	415008.0	4069212.9	11	pipe 3" long/10" deep
2_345	414992.8	4069258.2	6	not found
2_011	415061.0	4069037.8	375	conduit/2" deep
2_038	414958.8	4069189.4	119	old style lantern/10" deep
2_017	415028.0	4069057.2	218	not found
2_053	415046.8	4069042.6	79	rebar (too long left in ground)
2_103	415050.4	4069064.0	41	3" long pipe/6" deep
2_096	414947.7	4069166.5	44	steel rod/4" deep
2_056	415001.6	4069038.2	77	piece of rebar 2" deep
2_021	414909.5	4069134.2	186	fence post/1" deep (too long left in ground)
2_062	415042.4	4069020.6	73	scrap metal square 3"x3"/6" deep
2_059	414917.0	4069117.8	74	3" long wire/2" deep
2_018	414908.8	4069132.6	217	metal drum/48" deep (too long left in ground)
2_016	415009.2	4069051.0	230	7' rebar/6" deep
2_057	415068.9	4068973.1	74	wire/surface
2_023	415028.0	4069058.4	174	rebar 2' long/surface
2_083	415017.8	4069054.4	50	scrap metal
2_066	415026.8	4069056.7	65	small wire and rebar/2" deep
2_087	415007.2	4068996.4	48	scrap metal/2" deep
2_079	415001.6	4069048.6	53	scrap metal square/2" deep
2_100	414978.6	4069236.8	42	3" pipe/18" deep
2_094	414998.2	4069053.0	45	2" pipe/14" deep (too long left in ground)
2_101	415050.6	4069083.2	42	expended CO_2 cartridge/surface
2_092	414993.4	4069251.0	46	wire/surface (too long left in ground)
2_064	415006.0	4068994.8	67	under asphalt/no dig
2_366	414991.6	4069258.6	6	not found
2_090	415013.2	4069053.2	46	3' pipe/14" deep (too long left in ground)
2_430	414992.2	4069259.7	4	not found
2_063	414942.8	4069105.2	72	angle iron/6" deep
2_061	415025.8	4069049.0	73	4' long rebar/6" deep
2_060	414994.8	4069248.8	73	cable/12" deep
2_098	415023.0	4069061.6	43	10" long piece wire
2_015	414995.4	4069028.8	251	under asphalt/no dig
2_005	415003.2	4069013.4	2197	under asphalt/no dig
2_073	415068.1	4068973.7	62	wire/surface
2_067	415000.2	4069058.3	64	steel bar/2" deep
2_027	415023.3	4069056.7	160	1" pipe (too long left in ground)
2_071	414918.4	4069118.1	62	scrap metal/2" deep
2_003	414957.6	4069090.0	3378	cable/36" deep

Notes:

[1] - millivolt

Figures

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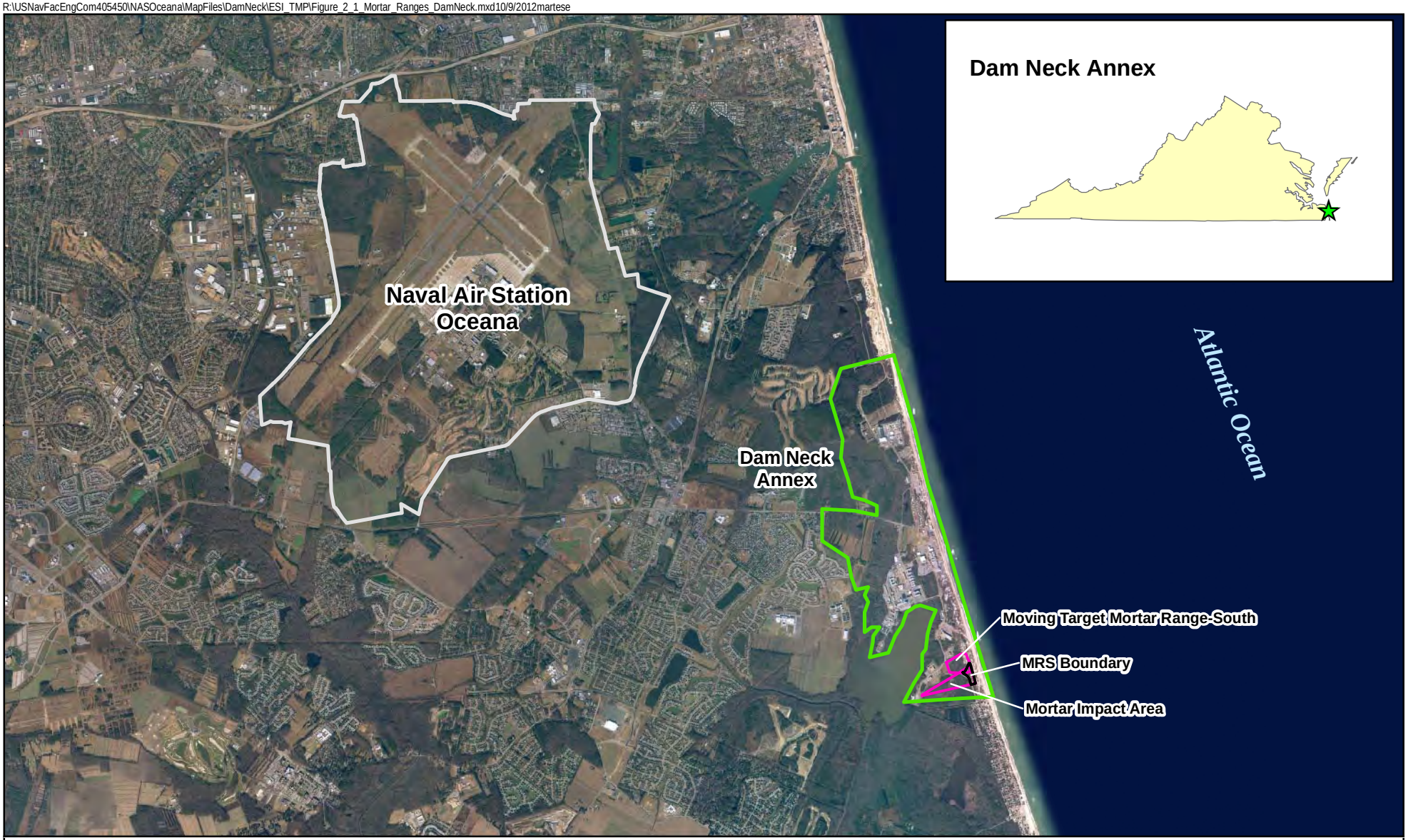

Legend
- NAS Oceana Boundary
- Dam Neck Annex Boundary
- MRP Sites
- MRS Boundary

N
W E
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0 0.6 1.2
Miles

Figure 1
Area and Site Location Map
Expanded Site Inspection
Naval Air Station Oceana
Virginia Beach, Virginia

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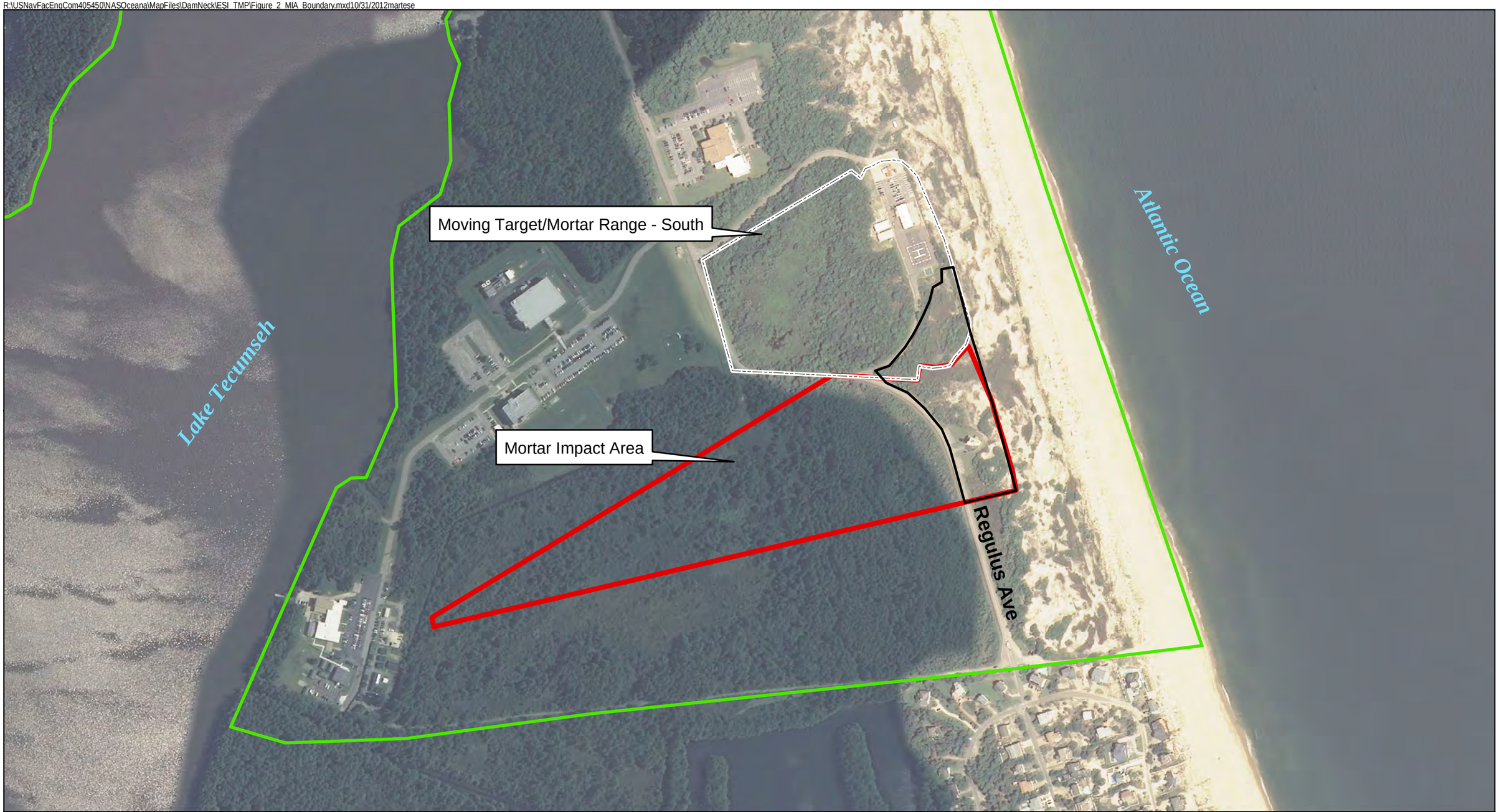

Legend

- Installation Boundary
- MRS Boundary
- Mortar Impact Area Boundary
- Historical Range Location

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0 400 800
Feet

Figure 2
MIA Boundary
Expanded Site Inspection
Naval Air Station Oceana
Virginia Beach, Virginia

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Legend

- Priority 1 Anomalies
- Installation Boundary
- Historical Range Location
- MRP Site
- MRS Boundary

N
W E
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0 200 400
Feet

Figure 3
Priority 1 Anomalies
Expanded Site Inspection
Naval Air Station Oceana
Virginia Beach, Virginia

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Attachment A

Cultural Debris Items
Mortar Impact Area
Dam Neck Annex - Naval Air Station Oceana
Virginia Beach, Virginia

Cultural Debris Items
Mortar Impact Area
Dam Neck Annex - Naval Air Station Oceana
Virginia Beach, Virginia

Attachment B

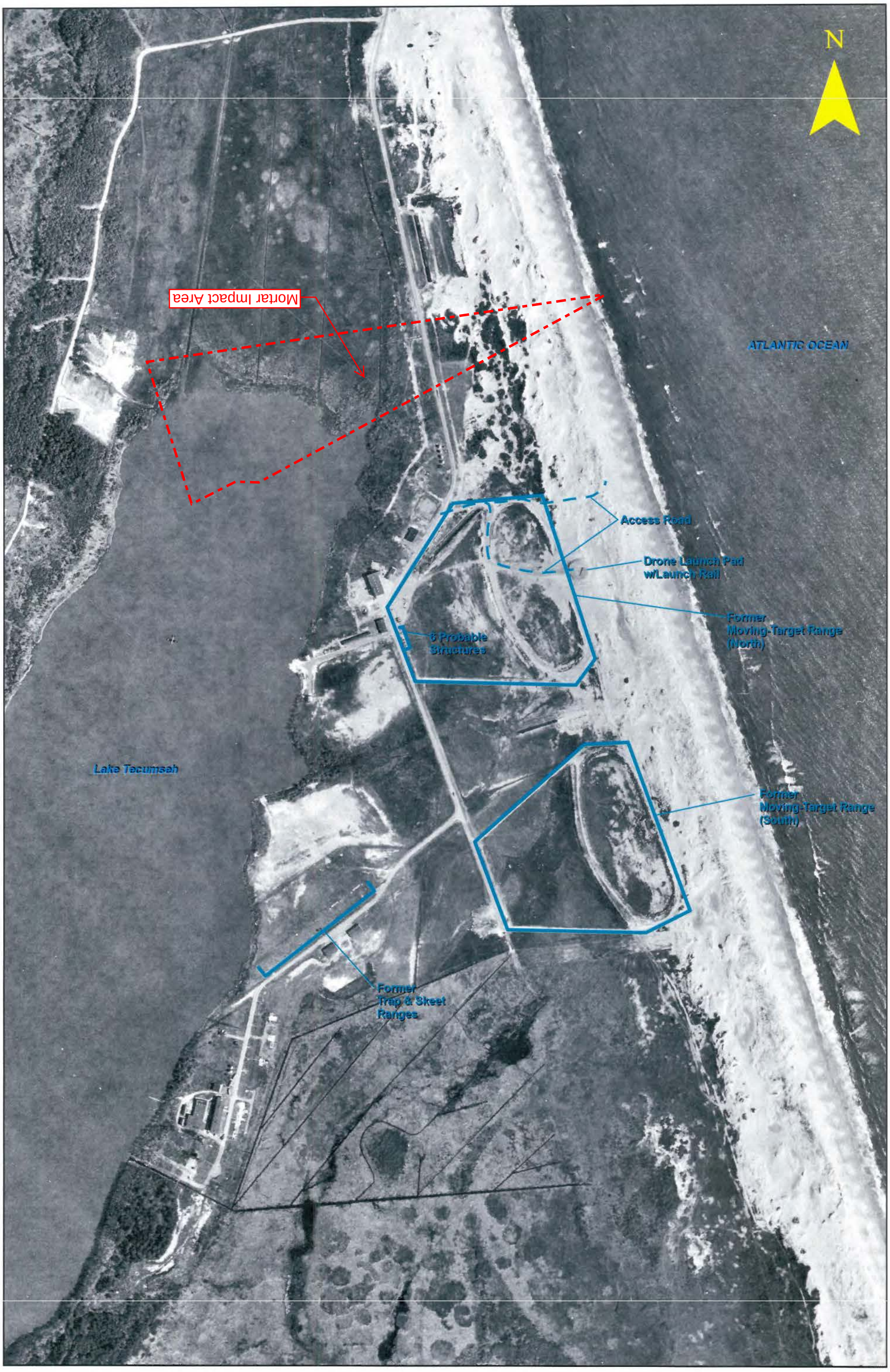

Figure 4
Dam Neck Annex, Virginia

April 18, 1951
Analysis Print

0 500 1,000 Feet

Figure 8
Dam Neck Annex, Virginia

October 25, 1964
Analysis Print