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FINAL SITE MANAGEMENT PLAN FISCAL YEAR 2015-2016 NSWC INDIAN HEAD MD

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TETRA TECH

FINAL

Site Management Plan
Fiscal Year 2015-2016

Environmental Restoration Program

Naval Support Facility Indian Head
Indian Head, Maryland

Naval Facilities Engineering Command
Washington

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EXECUTIVE SUMMARY

This Site Management Plan (SMP) was updated by NAVFAC Washington to present the activities that were conducted and those that are planned for sites at the Naval Support Facility Indian Head (NSFIH). This SMP addresses 47 Installation Restoration Program (IRP) sites,10 Munitions Response Program (MRP) sites, and 15 Areas of Concern (AOCs) at the Main Area , as well as 10 IRP sites, 21 MRP sites, and 10 AOCs at the Stump Neck Annex. There is one additional MRP site located off the installation.

Some of the previous SMPs for NSFIH did not include the Stump Neck Annex, because the Annex was being addressed by a separate program under a Resource Conservation and Recovery Act (RCRA) Corrective Action Permit. However, upon finalization of the Federal Facilities Agreement (FFA) between the Department of the Navy and United States Environmental Protection Agency (EPA), the RCRA sites at the Stump Neck Annex were included under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) program of the Main Area.

The schedules in this SMP were prepared to include the traditional steps for addressing contaminated sites under CERCLA. Existing documentation published in connection with past investigations and studies were used to describe completed activities and recommendations for future work. This SMP should be considered a “living document” because the information and schedules that are provided will be updated periodically as the work progresses at each site and more definitive information becomes available.

For the Main Area of NSFIH, 5 IRP sites and 8 MRP sites currently are undergoing a Remedial Investigation (RI) / Feasibility Study (FS). No further action has been recommended for one MRP site. One IRP site is in the Remedial Action (RA) or Interim Removal Action (IRA) phase. Five sites are Response Complete (RC) and are in the Long-Term Monitoring (LTM) phase. Three sites are in the Remedial Action-Operation (RA-O) phase. Sites 14, 15, 16, 49, 50, 53, 54, 55, and UXO 32 require No Further Action (NFA), but are included in Five-Year Reviews due to the presence of Institutional Controls (ICs) at the sites. NFA is either required or recommended for the remaining 27 sites (IRP Sites 2, 3, 4, 5, 6, 7, 8, 9, 13, 18, 19, 20, 23, 24, 25, 26, 27, 39, 40, 44, 45, 46, 48, 51, 52, and 56, and MRP Site UXO 029). Fifteen AOCs have undergone a desktop audit and one AOC is undergoing an SSI. As a result of the desktop audit, two of the AOCs were incorporated into IRP Site 11 (currently RC in LTM phase), one became an MRP site and is in the RI/FS phase, and twelve were recommended as NFA.

For the Stump Neck Annex, four sites are active ranges and will not be addressed under the IRP. One IRP site and seventeen MRP sites are in the RI/FS phase. One site (Site 36) is in the RC/LTM phase. One site is in the RA phase. NFA has been recommended for the remaining six sites (IRP Sites 32, 33, 34, 37, and 60, and MRP Site UXO 022). The Stump Neck Annex also includes 13 AOCs. During a desktop audit, these AOCs were categorized to remain AOCs, remain RCRA facilities, be closed with an NFA decision

document, or undergo an SSP or RI/FS. Currently, one AOC is managed under RCRA and six AOCs require NFA with a decision document. Solid Waste Management Unit (SWMU 14) now is considered an IRP site and is in the RI/FS phase (but it has not been assigned an IRP site number). One AOC is considered an active range (NFA under the IR Program), and the remaining four AOCs are undergoing a RI/FS.

With the finalization of the FFA, these areas are addressed under the CERCLA Program, and the SMP provides the schedules for these areas.

1.0 INTRODUCTION

NAVFAC Washington prepared this Site Management Plan (SMP) for the Naval Support Facility Indian Head (NSFIH), Maryland. The purpose of this SMP is to provide site-specific background information, present the activities that are currently being conducted or are planned at NSFIH during Fiscal Years 2015 through 2016, and project the long-term progress of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) program at the NSFIH in accordance with the Department of Navy (Navy) Installation Restoration Program (IRP) and Munitions Response Program (MRP) (collectively the Navy Environmental Restoration Program [ERP]).

1.1 DESCRIPTION OF THE INSTALLATION

Naval Support Facility Indian Head (NSFIH), formerly called Naval District Washington-Indian Head (NDWIH), Indian Head Division, Naval Surface Warfare Center (IHDIV-NSWC), Naval Ordnance Station (NOS), Naval Propellant Plant, Naval Powder Factory, and Naval Proving Grounds, is located in Charles County, Maryland, 30 miles south of Washington, D.C. The site is positioned along the Potomac River at the confluence of Mattawoman Creek, as shown on Figure 1-1. The site comprises about 3,500 acres. The Main Area, on the Cornwallis Neck Peninsula, is approximately 2,500 acres. The Stump Neck Annex is approximately 1,000 acres and is separated from the Main Area by Mattawoman Creek. Included as part of the Main Area are Marsh Island and Thoroughfare Island, which are in Mattawoman Creek. The Bullitt Neck Annex covers approximately 50 acres and is bounded by Mattawoman Creek to the north, east, and west and private property to the south. The two islands and Bullitt Neck Annex are not on the National Priorities List with the Main Installation and Stump Neck Annex. NSFIH has been active since 1890 and assumed its current name in 2005.

Operations are primarily located on the Main Area. The main tenant is IHDIV-NSWC and their principal mission on the Main Area of the facility is as follows:

- Provide services in energetics for all warfare centers through engineering, fleet and operational support, manufacturing technology, limited production, and industrial base support.

- Provide research, development, testing, and evaluation of energetic materials, ordnance devices and components, and other related ordnance engineering standards including chemicals, propellants and their propulsion systems, explosives, pyrotechnics, warheads, and simulators.

- Provide support to all warfare centers, military departments, and the ordnance industry for special weapons, explosive safety, and ordnance environmental issues.

The Stump Neck Annex of NSFIH is occupied primarily by tenant commands. Until recently, the Stump Neck Annex was occupied by two tenant commands, the Naval School Explosive Ordnance Disposal (NAVSCOLEOD) and Naval Explosive Ordnance Disposal Technology Division (NAVEODTECHDIV). The mission of NAVSCOLEOD was the training of active military personnel in performing explosive ordnance disposal (EOD) operations. In 1998, most operations at NAVSCOLEOD were relocated to Pensacola, Florida. Currently, NAVEODTECHDIV is the primary tenant command at the Stump Neck Annex. The missions of NAVEODTECHDIV are as follows:

- Provide EOD technology and logistics management.
- Develop war-essential elements of intelligence, equipment, and procedures to counter munitions, both United States and foreign, as required to support Department of Defense (DOD) components and the peacetime security needs of other agencies.

1.2 ENVIRONMENTAL HISTORY

Environmental studies at NSFIH and all other Navy facilities are conducted under the Navy IRP. The IRP was authorized by the Chief of Naval Operations under Instruction OPNAVINST 5090.1 dated May 2, 1983. Funding to pay for these environmental studies is allocated for Navy sites under the Environmental Restoration, Navy (ERN) Account.

The IRP parallels CERCLA (see Figure 1-2). Under CERCLA, abandoned waste sites that potentially contained hazardous constituents undergo several phases of environmental study that would ultimately determine the need for a remedy and, if necessary, the selection and implementation of the remedy for the site. The phases of investigation include the Preliminary Assessment (PA)/Site Inspection (SI), Remedial Investigation (RI)/Feasibility Study (FS), Record of Decision (ROD), and Remedial Design (RD)/Remedial Action (RA). CERCLA also provides for removal actions if a site poses an immediate threat to human health or the environment.

The NSFIH IRP includes a total list of 69 sites (see Table 1-1). Sites numbered 1 through 29, 39 through 57, and 66, 67, 69, and 70 are located on the Main Area of the facility. Sites numbered 30 through 38 and 58 through 65 are located on the Stump Neck Annex. SWMU 14 has become an IRP site, but has not been assigned an IRP site number. Area of Concern (AOC) 31 also is located on the Main Area of the facility.

Between 1990 and 2001, the sites at the Stump Neck Annex were managed under a Resource Conservation and Recovery Act (RCRA) Corrective Action Permit that provided for a process similar to CERCLA for site investigation and remediation. However, in 1998 the United States Environmental Protection Agency (EPA) Region 3 made the determination that the Stump Neck Annex was included under the National Priorities Listing of NSFIH. As a result of the finalization of the Federal Facilities Agreement

(FFA) between the Navy and EPA, the RCRA sites at the Stump Neck Annex are now included under the CERCLA program of the Main Area. Section 1.2.1 below describes the environmental history of the IRP at the Main Area of the facility. Section 1.2.2 describes the environmental history of the Stump Neck Annex sites. Table 1-1 lists all IRP sites, MRP sites, and AOCs at the Main Area and the Stump Neck Annex.

1.2.1 NSFIH Main Area

1.2.1.1 Initial Assessment Study (IAS) (Sites 1-29)

The first IRP objective is the collection and evaluation of data and historical evidence of hazardous constituents that might have contaminated the facility or that pose an imminent health hazard on or off the facility. The Navy completed an IAS of NSFIH in May 1983 (NEESA, 1983). The IAS is equivalent to the PA in the CERCLA process. The IAS examined a total of 38 potentially contaminated sites. Sites numbered 1 through 29 are located on the Main Area of the facility. Sites numbered 30 through 38 are located on the Stump Neck Annex. The 29 identified Main Area sites are listed below. Stump Neck Sites 30 through 38 are discussed in Section 1.2.2.

Site 1 Thorium Spill
Site 2 Waste Crankcase Oil Applied to Torrence Road
Site 3 Nitroglycerin Explosion, Nitration Building Area
Site 4 Lloyd Road Oil Spill
Site 5 X-Ray Building, Building 731
Site 6 Hypo Spill, Radiographic Facility Accelerator
Site 7 HMX Spill, Slurry Mix Building
Site 8 Mercury Deposits, Building 766
Site 9 Patterson Avenue Oil Spill
Site 10 Single-Base Propellant Grains Spill Area
Site 11 Caffee Road Landfill
Site 12 Town Gut Landfill
Site 13 Paint Solvents Disposal Area
Site 14 Waste Acid Disposal Pit
Site 15 Mercury Deposits in Manhole, Fluorine Lab
Site 16 Laboratory Chemical Disposal
Site 17 Disposed Metal Parts along Shoreline
Site 18 Hog Island
Site 19 Catch Basins at Chip Collection Houses
Site 20 Single Base Powder Facilities
Site 21 Bronson Road Landfill
Site 22 NG Slums Burning Site

Site 23 Hydraulic Oil Discharges from Extrusion Plant
Site 24 Abandoned Drain Lines
Site 25 Hypo Discharges from X-Ray Building No. 2
Site 26 Thermal Destructor 2
Site 27 Thermal Destructor 1
Site 28 Original Burning Ground
Site 29 The Valley

Of the 38 sites, the IAS recommended further study at Sites 5, 8, and 12 based on the available historical information. Because historical operations at Sites 6 and 25 were similar to those at Site 5, the IAS also recommended additional study at these two sites if further investigation of Site 5 indicated a problem.

The Navy completed a Confirmation Study at NSFIH in September 1985. The Confirmation Study was designed to evaluate the presence or absence of contamination at Sites 5, 8, and 12. The results of the study are documented in the *Naval Assessment for the Control of Installation Pollutants (NACIP) Confirmation Study, Naval Ordnance Station, Indian Head, Maryland* (CH2M HILL, 1985). Sites 5 and 8 were determined to have extensive levels of silver and mercury, respectively. Contamination in the pond adjacent to Site 12, however, was not found to be attributable to the landfill and is suspected to be the result of contamination from farther upstream.

The Navy completed removal actions at Sites 5 and 8 and continued investigations at Site 12. The removal actions involved the excavation of contaminated soil to prevent further transport and migration of the contamination and risks to ecologically sensitive receptors. At Site 5, the Navy removed silver-contaminated soil from one swale on the site in 1992 and additional contaminated soil from another swale on the site in 1995. The soil from the first excavation was encapsulated and placed in the base of a large earthen explosion barrier expansion (the soil represents less than 4 percent of the total volume of the expansion). The soil from the second excavation was used to reclaim a gravel borrow pit on the Stump Neck Annex at NSFIH. At Site 8, the Navy removed mercury-contaminated soil in 1984 and 1995. The soil removed in 1984 was disposed offsite, and soil removed in 1995 was disposed by encapsulating it in the earthen berm of Building 606 and covering it with a 1-foot thick layer of clay.

For Site 12, the Navy conducted a 5-year biomonitoring program, which demonstrated that contamination is not migrating from the landfill to the adjacent pond. An RI was completed in 1999. The RI recommended the preparation of an FS to evaluate methods for mitigating environmental risks and to address regulatory concerns connected with landfill closure requirements. The FS for Site 12 was completed in January 2001. Subsequently, a Proposed Plan and fact sheet were published for the installation of a 2-foot thick soil cover over the Town Gut Landfill, and a public meeting was held on January 23, 2001. The final design for the remediation of Site 12 was completed in February 2002, and construction was completed in August 2003. A ROD was completed and signed in September 2004.

In 1996, after further review of the original 29 IAS sites of the Main Area, the Navy, EPA and Maryland Department of the Environment (MDE) decided to subject Sites 6, 11, 13, 14, 15, 16, 17, 21, 25, and 28 to RIs because of the potentially higher risks associated with these sites. RIs for all of those sites have been completed. No further action (NFA) has been recommended for Sites 2, 3, 4, 5, 7, 9, 13, 18, 20, 23, 24, 25, and 26. Sites 11, 12, 21, 28, and 42 are considered "Response Complete (RC)" and are in the long-term monitoring (LTM) phase. Sites 14, 15, and 16 are part of the Lab Area (along with Sites 49, 50, 53, 54, and 55) and are considered RC, with Institutional Controls (ICs; or land use controls [LUCs]), in place at the sites. Sites 10, 22, and 29 have been moved to the MRP. The remainder of the original 29 IAS sites entered the SSP, which provided for a second evaluation, potentially including some additional sampling, to confirm the presence or absence of contamination at the sites and the need for further action. In 2010, Site 6 achieved "Site Closeout (SC)," as an interim removal action (IRA; or non-time-critical removal action [NTCRA]) resulted in an NFA ROD. In 2012, Site 19 and Site 27 achieved SC, as an IRA resulted in an NFA Decision Document. In 2013, Site 8 achieved SC, as an IRA resulted in an NFA Decision Document. Site 21 achieved RC in 2013, and is currently in the LTM phase. Remedial actions were completed at Sites 17, 47, and 57 and those sites are in the RA-O phase. Finally, in 2014, Records of Decision were signed for Site 28 which had a remedy of land use controls for groundwater and UXO 32 which had a remedy of land use controls for soil.

1.2.1.2 Supplemental PA (Sites 39-55)

The Navy completed a Supplemental PA Report for NSFIH in January 1992. The PA was an addendum to the IAS and examined an additional 17 sites located on the Main Area. The 17 additional sites are listed below. All but Sites 51 and 52 were recommended for further action (e.g., additional investigation, contaminant removal, etc.).

Site 39 Silver Release to Sediments
Site 40 Palladium Catalyst in Sediment
Site 41 Scrap Yard
Site 42 Olsen Road Landfill
Site 43 Toluene Disposal
Site 44 Soak-Out Area
Site 45 Abandoned Drums
Site 46 Cadmium Sandblast Grit
Site 47 Mercuric Nitrate Disposal Area
Site 48 NG Plant Disposal Area
Site 49 Chemical Disposal Pit
Site 50 Building 103 Crawl Space
Site 51 Building 101 Dry Well

Site 52 Building 102 Dry Well
Site 53 Mercury Contamination of the Sewage System
Site 54 Building 101
Site 55 Building 102

As a follow-up to the Supplemental PA, the Navy conducted an SI on Sites 39 through 50 and Sites 53 through 55 in two phases. SI Phase I focused on Site 42, Olsen Road Landfill, and SI Phase II focused on the remainder of the sites. Based on the results of the SI, all the sites were recommended for further study to determine the nature and extent of contamination and to identify the appropriate remedial action, if any.

The Navy completed work plans for the RI of these sites in 1997. RI Reports for Sites 41, 42, and 44 were completed in 1999. At Site 41, the RI recommended an FS to evaluate methods for mitigating human health and environmental risks posed by the contaminated surface soil at the site. The FS for Site 41 was completed in January 2001. Subsequently, a Proposed Plan and fact sheet were published for removing contaminated soil and removing polychlorinated biphenyl (PCB) contamination from the surface of the concrete slab within the Scrap Yard (Site 41), and a public meeting was held on February 20, 2001. The final design for the remediation of Site 41 was completed in mid-2002, and construction began in November 2002. Due to discovery of ordnance and explosives (OE) items, Site 41 was transferred to the MRP as UXO 32 in March 2004. A UXO 32 ROD was signed in 2014 with a remedy of NFA for soil. Groundwater at UXO 32 is being addressed under the Site 70 RI. At Site 42, the RI recommended an FS to evaluate methods to address regulatory concerns connected with landfill closure requirements. Additional field investigations were conducted during January and February 2002 to better define the extent of the landfill and to assess the possibility that groundwater contamination may have migrated downgradient from the landfill. Consequently, the FS was completed in June 2002. Later, a Proposed Plan and fact sheet were published for the installation of an impermeable landfill cap, and a public meeting was held on July 7, 2005. The final design for remediation of Site 42 was completed in March 2005, and construction was completed in May 2006. Site 42 is considered RC and is in the LTM phase. The RI for Site 44 recommended NFA, so no FS was prepared. A Proposed Plan and fact sheet for No Action were published, and a public meeting was held on February 20, 2001. The NFA ROD for Site 44 was signed in September 2002. At Site 49, the chemical disposal pit was removed in May 2001. Sites 49, 50, 53, 54, and 55 are considered part of the Lab Area (along with Sites 14, 15, and 16). These sites are considered RC and have ICs in place at the sites. A ROD to address groundwater contamination at Site 47 was signed in 2013 and the Remedial Action has been completed. That site is currently in the RA-O phase.

SSP investigations, which recommended NFA, were conducted at Sites 51 and 52 during January and February 2002. Site 43 is undergoing an RI/FS. RIs have been completed for the remainder of the 1992 PA sites, and Sites 39, 40, 45, 46, and 48 were recommended for NFA.

1.2.1.3 Additional Sites (56, 57, 66, 67, 69, and 70)

Since the 1992 PA, six additional sites have been discovered on the Main Area of NSFIH.

Site 56 Lead Contamination from Industrial Wastewater Outfall (IW) 87
Site 57 Building 292 TCE Contamination
Site 66 Turkey Run Disposal Area
Site 67 Hog-Out Facility
Site 69 Building 1018
Site 70 Groundwater Contamination Along Waterworks Way

Based on site sampling, the Navy performed Engineering Evaluations/Cost Analyses (EE/CAs) in 1994 and 1997, respectively, to evaluate the removal action options at Site 56 and Site 57. The Navy conducted a removal action at Site 56 in 1996 that involved the removal of lead-contaminated sediments at outfall IW–87 and from approximately 750 feet of outfall pipe. The sediment was properly disposed offsite. The pipe was then relined to prevent potential lead-contaminated shallow groundwater from infiltrating the pipe, which could deposit lead downgradient of the site. In 1998, the Navy completed a removal action at Site 57 to address infiltration of trichloroethene (TCE) contaminated groundwater into a storm sewer leading to outfall IW-80. Approximately 700 feet of storm sewer were lined to inhibit the accelerated migration of TCE. The Navy completed the RI at Site 57 in July 2000. During August 2001, a field investigation was conducted at Site 57 to collect field data to aid in the evaluation of remedial alternatives during the preparation of an FS. In May 2003, an HRC (hydrogen release compound) pilot study was performed at the site. Previously, a pilot-scale soil vapor extraction (SVE) study was conducted in 1997 to determine if SVE was an appropriate method for removing TCE from the site. The study is mentioned in the RI Report of July 2000 (Section 4.2.3, page 4-5) and states on page 4-6 that “Therefore, it was concluded that the subsurface conditions at Site 57, as experienced during this pilot study, are not well suited to the application of the SVE technology.” The results of the study are contained in the Findings Report Pilot-Scale Soil Vapor Extraction Study (B&R Environmental, 1997b). An EE/CA was finalized in August 2005, and a removal action to address soil contamination at the site was completed in July 2006. The Final FS was also completed in July 2006. The ROD to move to the RD/LTM phase at Site 57 was signed in September 2007. A Proton Reduction Technology (PRT) system was installed at the site in May 2015 to enhance monitored natural attenuation of groundwater. Site 57 is currently in the Remedial Action-Operation phase and is considered to have its Remedy in Place. Site 66 was identified as an unregulated dump site in 2004, and after an SSP was completed, a Site Investigation began in February 2007 (based on the results of the SSP sampling, it was decided to change the status from an SSP to an SI). The SI Report was completed in November 2008. Site 66 is currently in the RI/FS phase. Groundwater contamination was verified at Site 67 in 2006 and has been the subject of various pilot studies, including in situ groundwater treatment and monitored natural attenuation, under the Environmental Security Technology Certification Program. Site 67 is currently in the

RI/FS phase. Site 69 was identified during pre-demolition sampling efforts for Building 1018 in January 2011 (elevated perchlorate in soil). Site 69 is currently in the RI/FS phase. Site 70 is a result of groundwater contamination found upgradient of the Scrap Yard (Site 41/UXO 32) during the historical investigations and IRA at UXO 32. Site 70 is currently in the RI/FS phase.

1.2.1.4 Areas of Concern

Sixteen AOCs are being evaluated under the IRP in the Main Area Fifteen AOCs originally were identified as RCRA solid waste management units (SWMUs), and they are currently inactive. These AOCs have undergone a desktop audit, which involves a thorough review and evaluation of all existing or easily obtainable documentation on the identified areas. Based on this evaluation, the Navy, EPA Region 3, and MDE decided which AOCs should proceed to the SSP and which AOCs will require no action and can be closed out. A summary of the results of the desktop audit appears in Table 1-2. Notations have been added to the table to indicate changes made on decisions to address the SWMUs since the desktop audit was conducted.

AOC 31 was identified during pre-decontamination sampling efforts for Building 259 in January 2011 (elevated metals and energetics in soil). AOC 31 is undergoing an SSP and will likely be addressed by a removal action.

1.2.2 Stump Neck Annex

In November 1980, NSFIH submitted a RCRA Part A permit application to the EPA for designation of specific Stump Neck operations as hazardous waste management facilities with interim status. On October 6, 1981, EPA advised Naval Explosive Ordnance Technology Center (now NAVEODTECHDIV) that, pursuant to Section 3005 of RCRA regulations, the application did not demonstrate that the facility was required to have a permit under Section 3005 of the Act, and the application was returned. However, the EPA did issue an identification number (EPA I.D. No. MD4170090001), and the state of Maryland subsequently issued an interim permit (No. A223A).

The 1983 IAS identified nine sites (Sites 30 through 38) at Stump Neck Annex.

Site 30 Stump Neck Impact Area
Site 31 Old Demolition Range
Site 32 Suspected Tool Burial Site
Site 33 Scrap Metal Pit
Site 34 Tool Burial Site
Site 35 Torpedo Burial Site
Site 36 Closed Landfill

Site 37 Causeway
Site 38 Rum Point Landfill

Sites 36 and 38 were addressed as SSAs and continued under the SSP. The SSP provided for a second evaluation, including some additional sampling, to confirm the presence or absence of contamination at the sites and the need for further action. Final SSP Reports for both sites were completed in 2008. In 2011, Site 36 entered the "Remedial Action (RA)" phase. Debris removal was completed in 2014 and the site is now in the RC/LTM phase. Site 38 is currently in the RA phase. Sites 30 and 35 have been included in the MRP. Site 31 is an active range. The SSP fieldwork was completed at Site 37 in June 2011, and an NFA (i.e., No Action) Decision Document was signed in November 2011. NFA also has been recommended for Sites 32, 33, and 34.

Because the facility was identified as a RCRA operating facility, the 1984 Hazardous and Solid Waste Amendments (HSWA) to RCRA authorized EPA to require corrective action for releases of hazardous waste or hazardous constituents from SWMUs and other AOCs. The first phase of the corrective action program, as established by EPA, is to conduct a RCRA Facility Assessment (RFA). The RFA includes a preliminary review of all available relevant documents, and a Visual Site Inspection (VSI). The EPA Office of RCRA Programs conducted a RCRA SWMU Investigation of the NAVEODTECHDIV at the NSFIH and issued a final RFA in April 1990. The RFA identified the following 24 SWMUs at the Stump Neck Annex (some of which were already identified in the IAS as indicated below parenthetically):

SWMU 1	Rum Point Landfill (Site 38)
SWMU 2	Range 3 Burn Point
SWMU 3	Chicamuxen Creek's Edge Dump Site A
SWMU 4	Chicamuxen Creek's Edge Dump Site B
SWMU 5	Range 6
SWMU 6	Air Blast Pond
SWMU 7	Scrap Metal Pit (Site 33)
SWMU 8	Tool Burial Site (Site 34)
SWMU 9	Torpedo Burial Site (Site 35)
SWMU 10	Closed Landfill (Site 36)
SWMU 11	Suspected Tool Burial Site (Site 32)
SWMU 12	Waste Oil Storage Site
SWMU 13	Pink Water Treatment Tank
SWMU 14	Photographic Lab Septic Tank System
SWMU 15	Spent Photographic Solution Storage
SWMU 16	Thermal Treatment Tank
SWMU 17	Building 2015 – Chemistry Lab Accumulation Area

SWMU 18	Waste Pile
SWMU 19	Disposal Area No. 1
SWMU 20	Disposal Area No. 2
SWMU 21	Drum Storage Area
SWMU 22	Stump Neck Impact Area (Site 30)
SWMU 23	Old Demolition Range (Site 31)
SWMU 24	Causeway (Site 37)

In December 1990, EPA issued a RCRA Permit for Corrective Action (effective January 24, 1991 and expiring on January 23, 2001). Of the 24 SWMUs, the following six SWMUs were required by permit conditions to undergo further investigation. SWMU 1 had previously been designated as Site 38 during the IAS. SWMUs 2 through 6 were assigned IRP site numbers 58 through 62. The permit required Verification Investigations (VIs) at Sites 38, 60, and 62 and RCRA Facility Investigations (RFIs) at Sites 58, 59, and 61. A draft report for these investigations was completed in January 1998. More recently, Site 62 was moved to the MRP. Sites 58, 59, 60, and 61 have been designated as active ranges and will not be addressed under the IRP.

As indicated above, SWMU 10 (i.e., Site 36) entered the RA phase in 2011 and is undergoing LTM. A ROD for SWMU 1 (i.e., Site 38) was signed in 2014 and the site is currently in the RA phase. Sites 30, 31, 35, and SWMU 19 have been transferred to the MRP. SWMU 14 is currently in the RI/FS phase. SWMU 13 will be managed under RCRA. SWMU 16 is an active range. Additionally, NFA is planned for the remaining SWMUs.

Pursuant to the requirements of the RCRA Corrective Action Permit, NSFIH notified the EPA Region 3 RCRA Programs Branch in 1991 of three additional SWMUs that were not originally identified in the RFA but warranted further investigation. These three sites are listed below. These SWMUs were associated with operations of the Naval School Explosive Ordnance Disposal. The three “school” sites included Sites 63, 64, and 65 (SWMUs 25, 26, and 27), which became inactive with the relocation of the school in 1998. The Navy completed a VI report on the three sites in June 1996. Currently, the Navy is addressing these three sites under the MRP.

Site 63 / SWMU 25	Area 8
Site 64 / SWMU 26	Improvised Explosive Devices (IED)
Site 65 / SWMU 27	Inert Ordnance Disposal (IOD)

1.2.2.1 Areas of Concern

In 1991, the Navy discovered a fourth SWMU (i.e., SWMU 30), which was associated with a dry well that was connected to a laboratory located in Building 2015. SWMU 30 and ten of the twenty-four SWMUs

originally identified by the RFA were evaluated under the IRP as AOCs. These ten SWMUs are listed below.

SWMU 12	Waste Oil Storage Site
SWMU 14	Photographic Lab Septic Tank System (now an IRP site in the RI/FS stage)
SWMU 15	Spent Photographic Solution Storage
SWMU 16	Thermal Treatment Tank
SWMU 17	Building 2015 - Chemistry Lab Accumulation Area
SWMU 18	Waste Pile
SWMU 19	Disposal Area No. 1
SWMU 20	Disposal Area No. 2
SWMU 21	Drum Storage Area
SWMU 30	Building 2015 Dry Well

In 1992, NSFIH notified EPA of two additional sites at the Stump Neck Annex, which later became SWMUs 28 and 29. Both of these units have been included in the MRP.

SWMU 28	Old Skeet and Trap Range
SWMU 29	Small Arms Range (Pistol Range)

All twelve of the above AOCs were subjected to a desktop audit on November 28, 2001. The audit involved a thorough review of all existing or easily obtainable documentation/information on the identified areas. A total of thirteen Stump Neck AOCs were included in the desktop audit. Based on this evaluation, decisions were made by the Project Managers as to which AOCs will proceed to the SSP and which AOCs will require no action and can be closed out. Table 1-3 provides a summary of the results of the audit. Notations have been added to the table to indicate changes made on decisions to address the SWMUs since the desktop audit was conducted.

The FFA officially incorporated the Stump Neck SWMUs from the RCRA Program into the NSFIH CERCLA Program. SWMUs have been evaluated under the IRP as AOCs.

1.2.3 Additional Munitions Response Program Sites

In 2005, the Navy completed a PA for MRP sites identified in a range inventory. This included 7 sites on the Main Area, 16 sites on the Stump Neck Annex, and five Water Area Munitions Study (WAMS) sites. For the water sites, two are located at the Main Area, two are at the Stump Neck Annex, and one is off-installation. Some sites already existed as IRP sites under the FFA and were moved to the MRP. The seven sites at the Main Area are listed below.

UXO 6	NG Slums Burning Ground
UXO 9	Single Base Propellant Grains Spill Area
UXO 11	The Valley
UXO 13	FDR Skeet Range
UXO 20	Safety Thermal Treatment Point
UXO 29	Southwestern Pistol Range
UXO 30	Gate 3 Burning Ground

The 16 sites evaluated in the PA for the Stump Neck Annex are included below.

UXO 1	Air Blast Pond
UXO 2	Area 8
UXO 4	Basic IED Area
UXO 5	Advanced IED Area
UXO 10	Stump Neck Impact Area
UXO 12	Torpedo Burial Site
UXO 14	Marine Rifle Range
UXO 15	Old Skeet and Trap Range
UXO 16	Rum Point Skeet Range
UXO 17	Small Arms (Pistol) Range
UXO 21	Test Area 1
UXO 22	Test Area 2
UXO 23	Torpedo Casing Disposal Area
UXO 25	Roach Road Rifle Range
UXO 26	The Valley Impact Area
UXO 28	EOD School Demolition Area

The five water area sites include the Igniter Area (UXO 19) and Water Impact Area (UXO 33) at the main installation, the Battle Range Firing Area (UXO 18) and Sonar Training Area (UXO 27) at the Stump Neck Annex, and the Pope's Creek site (UXO 31) located off the installation (Figure 1-3).

The PA for the MRP sites concluded that an SI be performed for all of the MRP sites listed above. Consequently, an SI was completed in 2010 and UXO 022 and UXO 029 were found to need NFA, and an NFA Decision Document was signed for each site in February 2011 and October 2011, respectively. The remainder of the MRP sites are currently in the RI/FS phase.

1.3 PURPOSE OF THE SITE MANAGEMENT PLAN

The SMP is intended to be a living document. It serves as a tool to support planning, scheduling, and budgeting future activities at sites located on NSFIH. The SMP will be updated annually, as required by the FFA.

In addition to providing a record of the milestones achieved in connection with each site, the SMP presents the anticipated milestones for the future work necessary to address the potential adverse impacts of contamination at each site.

1.4 FORMAT OF THE SITE MANAGEMENT PLAN

This SMP document is organized into four sections and three appendices. Section 1.0 presents a brief description of the NSFIH, a summary of the facility's overall environmental history, and a description of the purpose of this document. Section 2.0 provides fact sheets for each site and AOC in the program. Each of the fact sheets presents a compilation of historical information and summarized data extracted from previously prepared studies and reports. All the documents supplying information to this SMP are listed in the References section located at the end of this document. Section 3.0 consists of two maps of the NSFIH showing the approximate location of each of the sites discussed. Section 4.0 provides a schedule of future activities for the sites recommended for further action. The schedules present the sequence of activities anticipated to be necessary for the completion of critical steps in the IR Program. Appendices A and B supplement the Site Location Map by presenting figures for each of the sites. Appendix A includes sites at the Main Area and Appendix B includes sites at the Stump Neck Annex. These figures offer a more detailed view of site locations and features in the immediate vicinity of the respective sites. Appendix C provides site photographs organized by site number.

2.0 SITE DESCRIPTIONS

Section 2.0 contains a series of fact sheets addressing each site's history, current conditions, recent investigative activity, and recommended future action. Section 2.0 contains limited historical information representing a compilation of historical documents. References from which the fact sheets were developed are listed in the bibliography at the end of this SMP.

Section 2.1 contains descriptions of the sites and AOCs located on the Main Area of NSFIH. Section 2.2 contains descriptions of the sites and AOCs located at the Stump Neck Annex.

2.1 SITE DESCRIPTIONS – MAIN AREA

This section consists of fact sheets for the Main Area sites and AOCs.

SITE 1 – THORIUM SPILL

(OLD MAP GRID C27)
IRP Site 1
Fact Sheet

1. **Contamination:** Thorium.

2. **Location:** Special Weapons Disposal Building (Building 900).

3. **From:** Potential thorium contamination from ordnance training session near Building 900.

4. **When:** Date of training session is unknown.

5. **Generated By:** Thorium items were used for ordnance training on the ground near Building 900. If these items were not completely removed after the training session, then these items may have contaminated the ground near Building 900.

6. **Amount:** Unknown.

7. **Work Completed:**

   a. The site was identified in the Initial Assessment Study (IAS) of the Naval Assessment and Control of Installation Pollutants (NACIP) Program. NACIP is the former name of the Navy Installation Restoration Program (IRP), and the IAS is equivalent to the Preliminary Assessment portion of the IRP. The IAS recommended that a thorough survey and Confirmation Study be conducted prior to any excavation or change in land use.

   b. Site Screening Process Investigation started in April 2004. The final SSP Report was submitted in May 2009.

   c. Final EE/CA was submitted in September 2010 and Final Action Memorandum was issued by the Navy in February 2011.

   d. Navy Radiological Affairs Support Office (RASO) submitted the Final Removal Action Work Plan (RAWP) (including an Erosion and Sediment Control Plan [ESCP]) in December 2012.

   e. Interim removal action (IRA) started in February 2013, but suspended in March 2013 due to the uncertainty of the extent of contamination (based on verification results) and the presence of munitions and explosives of concern (MEC). The site was temporarily backfilled and stabilized in September 2013.

8. **Current Status:** Soil characterization to fully delineate limits of soil requiring removal was completed in March 2015. The final IRA phase is planned for late 2015.

SITE 2 – WASTE CRANK CASE OIL APPLIED TO TORRENCE ROAD

(OLD MAP GRID E17)
IRP Site 2
Fact Sheet

1. **Contamination:** Waste oil.

2. **Location:** Torrence Road behind Building 290 (Public Works Department maintenance garage).

3. **From:** Waste oil from Transportation Branch buildings was reportedly applied to unpaved roads for dust control.

4. **When:** Prior to 1965.

5. **Generated By:** Waste oils from the Transportation Branch buildings consisted of crankcase, hydraulic, transmission, and motor oils.

6. **Amount:** The Transportation Branch buildings generated approximately 7,700 gallons annually.

7. **Work Completed:** The site was identified in the Initial Assessment Study (IAS) of the Naval Assessment and Control of Installation Pollutants (NACIP) Program. NACIP is the former name of the Navy Installation Restoration Program (IRP), and the IAS is equivalent to the Preliminary Assessment portion of the IRP. The IAS recommended that a Confirmation Study not be conducted for Site 2.

8. **Current Status:** Site Screening Process (SSP) investigation started in April 2004. The final SSP Report was submitted in February 2006, and a Decision Document which recommended no further action (NFA) was signed in March 2006.

SITE 3 – NITROGLYCERIN EXPLOSION, NITRATION BUILDING AREA

(OLD MAP GRID E17)
IRP Site 3
Fact Sheet

1. **Contamination:** Residual nitroglycerin.

2. **Location:** Vicinity of Nitration Building, Building 1543.

3. **From:** Explosion in former Nitration Building, Building 675.

4. **When:** 1971.

5. **Generated By:** Explosion in former Nitration Building.

6. **Amount:** Unknown.

7. **Work Completed:** The site was identified in the Initial Assessment Study (IAS) of the Naval Assessment and Control of Installation Pollutants (NACIP) Program. NACIP is the former name of the Navy Installation Restoration Program (IRP), and the IAS is equivalent to the Preliminary Assessment portion of the IRP. The IAS recommended that a Confirmation Study not be conducted for Site 3.

8. **Current Status:** A Site Screening Process investigation was started in 2004. However, review of sample results obtained in this area in 2002 for Military Construction Project P161 led to the signing of a Decision Document in February 2005, which recommended no further action (NFA).

SITE 4 – LLOYD ROAD OIL SPILL SITES

(OLD MAP GRID E37)
IRP Site 4
Fact Sheet

1. **Contamination:** Waste oil.

2. **Location:** On Lloyd Road near the Public Works Department Maintenance garage area, Building 290.

3. **From:** Waste oil spilled from a dumpster that was used to store waste petroleum.

4. **When:** Prior to 1981.

5. **Generated By:** Waste oil from the Public Works maintenance operations was deposited in a dumpster. Waste oil consisted of fuel oil, motor oil, and kerosene.

6. **Amount:** Estimated to be 50 to 100 gallons.

7. **Work Completed:** The site was identified in the Initial Assessment Study (IAS) of the Naval Assessment and Control of Installation Pollutants (NACIP) Program. NACIP is the former name of the Navy Installation Restoration Program (IRP), and the IAS is equivalent to the Preliminary Assessment portion of the IRP. The IAS recommended that a Confirmation Study not be conducted for this site.

8. **Current Status:** Site Screening Process (SSP) investigation started in April 2004. The final SSP Report was submitted in February 2006, and a Decision Document which recommended no further action (NFA) was signed in March 2006.

SITE 5 – X-RAY BUILDING 731

(OLD MAP GRID F6, F7)
IRP Site 5
Fact Sheet

1. **Contamination:** Silver from spent fixer and developer.

2. **Location:** Drainage swales behind Building 731 that flow to Mattawoman Creek.

3. **From:** Discharge of spent fixer and developer for X-Ray film.

4. **When:** 1953 to 1965.

5. **Generated By:** Fixer and developer are used to develop X-Ray film. Some of the silver, which is on the film, becomes "fixed" to the X-Ray and the remainder of the silver is washed off. Both the spent fixer and wash water, which contain silver, were discharged behind Building 731 into two separate swales.

6. **Amount:** Up to 720 pounds of silver.

7. **Work Completed:**

   a. The site was identified in the Initial Assessment Study (IAS) of the Naval Assessment and Control of Installation Pollutants (NACIP) Program. NACIP is the former name of the Navy Installation Restoration Program (IRP), and the IAS is equivalent to the Preliminary Assessment (PA) portion of the IRP.

   b. A Confirmation Study, the NACIP equivalent of an IRP Site Inspection (SI), was completed in 1985 to determine if silver was actually present in the sediment at the site.

   c. A removal action was performed on the eastern swale from November 1992 through January 1993. The silver-contaminated soil of the swale was removed, solidified, and stabilized and then placed in an earthen berm.

   d. A removal action was performed on the western swale from December 1994 through January 1995. The silver-contaminated soil of the swale was removed and placed in a borrow pit at Rum Point on Stump Neck Annex. The soil was covered with an impermeable layer of soil (clay), which was then covered with topsoil and reseeded.

   e. A Site Screening Process (SSP) field investigation was completed in 2001 and 2002. Groundwater monitoring wells were installed and sampled for Target Compound List (TCL) volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), and Target Analyte List (TAL) metals. Sediment and surface water samples were collected in a portion of the western swale, which was previously not sampled, and analyzed for TAL metals.

8. **Current Status:** The Final SSP Report was completed in December 2003 and recommended no further action (NFA). A Concurrence Letter for NFA was signed by the Navy and EPA with concurrence from the MDE in January 2004.

SITE 6 – HYPO SPILL, RADIOGRAPHIC FACILITY ACCELERATOR CONTROL BUILDING AND OPEN DRAIN

(OLD MAP GRID G3)
IRP Site 6
Fact Sheet

1. **Contamination:** Silver from spent fixer.

2. **Location:** Drainage swales south of Buildings 1349 and 1140.

3. **From:** Spill of fixer for X-Ray film during transfer of storage tank contents.

4. **When:** Reportedly 1965 to 1977.

5. **Generated By:** Fixer and developer are used to develop X-Ray film. Some of the silver, which is on the film, becomes "fixed" to the X-Ray, and the remainder of the silver is washed off.

6. **Amount:** 10 gallons.

7. **Work Completed:**

   a. The site was identified in the Initial Assessment Study (IAS) of the Naval Assessment and Control of Installation Pollutants (NACIP) Program. NACIP is the former name of the Navy Installation Restoration Program (IRP), and the IAS is equivalent to the Preliminary Assessment (PA) portion of the IRP. The IAS recommended that a Confirmation Study should be conducted for Site 6 if the Site 5 study revealed a danger to aquatic life. Because Site 5 soil was determined to pose a threat to ecological receptors, it was determined that a remedial investigation (RI) should be conducted at Site 6.

   b. RI fieldwork was completed at Site 6 in 2001. Surface soil, shallow subsurface soil, surface water, and shallow groundwater samples were collected and analyzed for silver. The final RI report was completed in April 2004. The RI recommended further action to address health hazards and potential ecological risk posed by silver contamination.

   c. An additional investigation was conducted in October 2005 to identify the lateral extent of silver and to assess the need for a BERA or remediation outside the fenced area.

   d. An interim removal action (IRA) inside the fenced area was completed in September 2008.

   e. A Proposed Plan was completed in February 2009. A public meeting for the Proposed Plan was held on February 19, 2009.

   f. A Record of Decision (ROD) was signed in January 2010.

8. **Current Status:** The 2008 IRA resulted in no further action (NFA) for the site, which is documented in the ROD.

SITE 7 – HMX SPILL, SLURRY MIX BUILDING

(OLD MAP GRID G17)
IRP Site 7
Fact Sheet

1. **Contamination:** Lead, HMX, phthalate esters, nitrate esters, amines, oil, and grease.

2. **Location:** Slurry Mix Building, Building 682, and associated open drainage ditch, which flows to IW10.

3. **From:** Wastewater from dewatering HMX and building floor wash-down.

4. **When:** Between 1964 and 1968.

5. **Generated By:** Facility processing procedures included dewatering HMX, which was purchased in a slurry form and dewatered in an eductor vacuum filter. Wastewater was discharged into the floor drain and from there to an open storm ditch, which flows to IW10.

6. **Amount:** 168 pounds of HMX and 5 pounds of lead.

7. **Work Completed:** The site was identified in the Initial Assessment Study (IAS) of the Naval Assessment and Control of Installation Pollutants (NACIP) Program. NACIP is the former name of the Navy Installation Restoration Program (IRP), and the IAS is equivalent to the Preliminary Assessment (PA) portion of the IRP. The IAS recommended that a Confirmation Study not be performed for Site 7.

8. **Current Status:** A Site Screening Process (SSP) investigation started in August 2004. The Final SSP Report was submitted in December 2005, and a Decision Document, which recommended no further action (NFA), was signed at the same time.

SITE 8 – MERCURY CONTAMINATION FROM BUILDING 766

(OLD MAP GRID G-20)
IRP Site 8
Fact Sheet

1. **Contamination:** Mercury.

2. **Location:** The drainage system from Building 766, which included a stormwater manhole, a ditch, and a pond that discharges into Mattawoman Creek.

3. **From:** Lab operations.

4. **When:** 1958 to 1981.

5. **Generated By:** During sensitivity tests, nitrometer bulbs, which contained mercury, sometimes exploded under pressure. After testing, the spent mercury, which also contained sulfuric acid, was poured into a "slop jar." Tap water was run into the jar to remove the sulfuric acid from the mercury. Small spills from transferring mercury to the slop jar were common. Jars of mercury often broke during rinsing in the sink.

6. **Amount:** Estimates range from 23 to 500 pounds of elemental mercury.

7. **Work Completed:**

   a. The site was identified in the Initial Assessment Study (IAS) of the Naval Assessment and Control of Installation Pollutants (NACIP) Program. NACIP is the former name of the Navy Installation Restoration Program (IRP), and the IAS is equivalent to the Preliminary Assessment (PA) portion of the IRP.

   b. A Confirmation Study, the NACIP equivalent of an IRP Site Inspection (SI), was completed in 1985 to determine if mercury was actually present in the sediment at the site.

   c. While construction work was being performed in the area of Building 766 in 1985, the contractor inadvertently broke the drain pipe leading from the building to a manhole. Mercury was discovered in the pipe and ground at the site of excavation. Approximately 200 drums of mercury-contaminated soil were removed from the area near the manhole and properly disposed.

   d. The floor drains were sealed shut with concrete, and sink drains were re-routed to the sewage treatment system. In addition, mercury traps were placed on the drains to collect any mercury that may inadvertently enter the drain.

   e. A Confirmation Study was performed in 1985 to determine the extent of mercury contamination throughout the ditch. The mercury in the soil was present in the highest concentration directly under the pipe which discharges into the ditch. The mercury concentrations then decreased downstream from the pipe. The Confirmation Study recommended monitoring mercury levels over a 5-year period. Water monitoring samples taken between the pond and Mattawoman Creek did not indicate any movement of the mercury.

   f. The U.S. Fish and Wildlife Service sampled fish in Mattawoman Creek for the 5-year period ending in 1991 to determine if fish were bioaccumulating mercury. Fish upstream from the entrance location to the creek have been sampled to determine background levels of mercury

within the fish. The background level is the amount of mercury that is normally found in the fish. The U.S. Fish and Wildlife Service has also sampled fish downstream from the entrance location to the Creek to determine if the levels are different. In the past, fish downstream were found to contain mercury at a level slightly higher than those upstream. The latest report from the U.S. Fish and Wildlife Service indicates that the mercury levels in both the fish upstream and downstream from IRP Site 8 contain equivalent levels of mercury. Mercury levels of the fish from both areas, however, have been within regulatory limits.

g. A potential problem with IRP Site 8 is the transport of mercury downstream through entrainment, especially during storm events, such as heavy rains. With the installation of a weir in June 1992, the tidal pond acts as a natural sediment basin. The weir provides additional settling time to ensure that any sediment that has flowed from the upper section of the stream into the pond will not exit into Mattawoman Creek.

h. Approximately 200 water and sediment samples were taken from the ditch, the pond, and Mattawoman Creek during the week of August 24, 1992 to better characterize the location and extent of mercury in the drainage system. Based on the sample results, an Engineering Evaluation and Cost Analysis (EE/CA) was prepared to determine the best alternative to be taken to ensure protection of human health and the environment. The alternative recommended in the EE/CA was to remove the area of highest mercury contamination. This area, the upper section of the stream, could be considered a source to the receptor (tidal pond) downstream, it was approximately 300 feet in length, and it contained mercury at concentrations above 10 parts per million (ppm).

i. In October 1992, a biomonitoring program was initiated to determine the effect of mercury on the biota (plant and animal life) in the tidal pond. The results of the study did not show any adverse effects on the biota of the pond due to the mercury.

j. In June 1994, the removal action was begun to remove the mercury-contaminated sediment in the first 300 feet of the ditch, as recommended in the EE/CA. The soil that was removed was placed in the soil cover of an explosives storage magazine, Building 606. The soil was capped with clay and then topsoil and was reseeded. This work was completed in December 1994.

k. A Site Screening Process investigation started in April 2004. Additional investigation of lead and mercury in the middle and lower stream sections was completed in September 2005.

l. A Desktop Evaluation of existing data was completed in September 2006, which recommended additional sampling since most of the existing data used in the evaluation are more than 10 years old. The additional investigation was completed in September 2006 and recommended no further action (NFA) for the site, with the exception of the lower stream and upper pond.

m. Additional sampling to determine the horizontal and vertical extent of lead and mercury in soil and sediment in the lower stream and pond area was completed in October 2008 and May 2009. The subsequent Technical Memorandum discussing the results and preliminary remediation goals for a future excavation was finalized in January 2011.

n. A Final EE/CA evaluating removal options was submitted in December 2011 and a Final Action Memorandum documenting the decision to perform an interim removal action (IRA) was issued by the Navy in June 2012.

o. The IRA was completed in November 2012.

8. **Current Status:** A Construction Completion Report and Decision Document which recommended NFA were finalized in December 2013.

SITE 9 – PATTERSON AVENUE OIL SPILL

(OLD MAP GRID G37)
IRP Site 9
Fact Sheet

1. **Contamination:** Fuel oil.

2. **Location:** South of Building 320.

3. **From:** Spill of fuel oil from a tanker truck.

4. **When:** Circa 1958.

5. **Generated By:** Spill of fuel oil from a tanker truck.

6. **Amount:** 10,000 gallons.

7. **Work Completed:** The site was identified in the Initial Assessment Study (IAS) of the Naval Assessment and Control of Installation Pollutants (NACIP) Program. NACIP is the former name of the Navy Installation Restoration Program (IRP), and the IAS is equivalent to the Preliminary Assessment (PA) portion of the IRP. The IAS recommended that a Confirmation Study not be performed for Site 9.

8. **Current Status:** A Site Screening Process investigation started in April 2004. However, review of sample results obtained for the closure of nearby underground storage tanks (USTs) led to the signing of a Decision Document in October 2004, which recommended no further action (NFA).

SITE 10 / UXO 9 – SINGLE-BASE PROPELLANT GRAINS SPILL AREA

(OLD MAP GRID I37 TO I39; O37 TO O39)
IRP Site 10 / MRP Site UXO 9
Fact Sheet

1. Contamination: Nitrocellulose (NC) propellant grains.

2. Location: 14-acre site near the Powder Dry Houses.

3. From: Spill of NC grains during railroad transportation.

4. When: Estimated between 1900 and 1957.

5. Generated By: Spill of NC grains during railroad transportation.

6. Amount: Unknown.

7. Work Completed:

a. The site was identified in the Initial Assessment Study (IAS) of the Naval Assessment and Control of Installation Pollutants (NACIP) Program. NACIP is the former name of the Navy Installation Restoration Program (IRP), and the IAS is equivalent to the Preliminary Assessment (PA) portion of the IRP. The IAS recommended that a Confirmation Study not be performed for Site 10.

b. The site was moved to the Munitions Response Program (MRP) and designated as UXO 09.

c. The final Preliminary Assessment Report, which recommended that a Site Inspection be performed, was completed in September 2005.

d. The Site Inspection was completed in September 2010 and recommended a Remedial Investigation (RI) for munitions constituents (MC) in soil and groundwater.

e. The Final RI UFP-SAP Work Plan (along with the Explosive Safety Submission [ESS] Determination Request) was submitted in November 2012.

f. RI fieldwork was completed in August 2013.

8. Current Status: Included in the MRP as Site UXO 009. The Draft RI Report was submitted in March 2014 and is currently on hold pending the results of arsenic sampling and speciation which is planned for 2016.

SITE 11 – CAFFEE ROAD LANDFILL

(OLD MAP GRID K6, L6)
IRP Site 11
Fact Sheet

1. **Contamination:** Metals and polycyclic aromatic hydrocarbons (PAHs) from disposal and burning of bulk metals items.

2. **Location:** Terminus of Caffee Road, from east of Building 1608 to the unnamed creek discharging to the Mattawoman Creek on the west side of the site.

3. **From:** Disposal of building debris, open burning residues, and bulk metal items.

4. **When:** Unknown.

5. **Generated By:** Disposal and open burning of various wastes.

6. **Amount:** Unknown.

7. **Work Completed:**

   a. The site was identified in the Initial Assessment Study (IAS) of the Naval Assessment and Control of Installation Pollutants (NACIP) Program. NACIP is the former name of the Navy Installation Restoration Program (IRP), and the IAS is equivalent to the Preliminary Assessment (PA) portion of the IRP.

   b. In late 1980, NSFIH removed approximately 5,000 to 6,000 cubic yards of deposited material. This material was primarily flashed metal parts and dunnage, which were removed by a private contractor for off-station disposal.

   c. Initial Remedial Investigation (RI) fieldwork was completed in 2000. Surface soil, subsurface soil, sediment, surface water, and groundwater samples were collected in the area of waste disposal and analyzed for Target Compound List (TCL), volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), and Target Analyte List (TAL) metals.

   d. Further historical information was obtained indicating the presence of four open burning pits on the eastern side of the area initially investigated. Additional RI sampling of surface and subsurface soils, sediment, surface water, and groundwater for TCL VOCs, TCL SVOCs, and TAL metals was conducted on the eastern side of the site in 2002.

   e. The Final RI report was completed in April 2004. The RI recommended a Feasibility Study (FS).

   f. A wetland delineation was completed in February 2005.

   g. The Baseline Ecological Risk Assessment (BERA) Report was finalized in July 2005.

   h. The Draft FS Report was submitted in December 2005, and a third party optimization review of the document was completed in March 2006.

i. A geophysical survey was completed in May 2006 to provide a better delineation of the horizontal and vertical extent of waste and to identify subsurface anomalies. A hydrographic survey was completed in November 2007. Design of living shoreline stabilization and sediment remediation alternatives are under review.

j. The FS Report was finalized in July 2008.

k. A Proposed Plan was completed in August 2008 recommending a protective soil cover, Institutional Controls (ICs), and groundwater long-term monitoring (LTM) for the soil, solid waste, and near-shore sediment in Area A; and an in situ cap and ICs for the near-shore sediment adjacent to Area B along Mattawoman Creek. A public meeting was held on September 18, 2008.

l. The Record of Decision (ROD) was signed in September 2009.

m. The 100% Remedial Design (RD) was submitted in November 2010.

n. The Remedial Action Work Plan was finalized in May 2011 and the Remedial Action was completed in January 2012.

o. The Final Land Use Control (LUC) RD and LTM Plan were completed in January 2012.

p. The Final Construction Completion Report was submitted in July 2012. The Remedial Action Completion Report (RACR) was finalized in 2014.

8. Current Status: Site 11 groundwater is in the LTM phase currently on a semiannual sampling frequency. Groundwater samples are analyzed in accordance with *Maryland Solid Waste Tables 1 and 2*. The landfill cover/conditions and ICs are inspected during each LTM sampling event.

SITE 12 – TOWN GUT LANDFILL

(OLD MAP GRID K-22)
IRP Site 12
Fact Sheet

1. **Contamination:** Construction debris, including scrap metal, empty cans, and drums containing paint and varnish residue, demolition debris, such as asphalt, concrete, and rubble, possible chemical waste

2. **Location:** Approximately 4 acres bisected by Atkins Road extension (northwest of Building 471).

3. **From:** Disposal of landscaping waste, fill material, rubble, and construction debris.

4. **When:** 1968 to 1980.

5. **Generated By:** Disposal of various wastes.

6. **Amount:** Unknown.

7. **Work Completed:**

   a. The site was identified in the Initial Assessment Study (IAS) of the Naval Assessment and Control of Installation Pollutants (NACIP) Program. NACIP is the former name of the Navy Installation Restoration Program (IRP), and the IAS is equivalent to the Preliminary Assessment (PA) portion of the IRP.

   b. A Confirmation Study, the NACIP equivalent of an IRP Site Inspection (SI), was completed in 1985 to determine if contamination was actually present at the site. Low levels of metals were found in the sediment at this site. The Confirmation Study recommended monitoring the site for 5 years to ensure that no contamination is migrating from the landfill.

   c. The 5-year monitoring results did not show that any contamination is migrating from this area.

   d. A remedial investigation report for Site 12 was completed in July 1999. The report determined that the human health risk for non-residential scenarios is within acceptable limits. The document identified a potential ecological risk in connection with surface soil contamination. The document recommended a feasibility study report to evaluate alternatives that would address the ecological risk, as well as the State of Maryland requirements for closing landfills.

   e. A feasibility study was completed in January 2001. The study developed several potential remedial alternatives, including one requiring total landfill removal and others involving various capping scenarios combined with institutional controls.

   f. A Proposed Plan was completed in January 2001. The preferred remedial alternative presented in the document provided for covering the landfill with a 2-foot-thick soil cover.

   g. A public meeting was held on January 23, 2001 to present the Proposed Plan to the public.

   h. Completion of the final design documents occurred in February 2002.

   i. Due to unresolved issues related to Land Use Controls between the EPA and the Navy with respect to Records of Decision (RODs), an Engineering Evaluation and Cost Analysis was

prepared in June 2002. On June 27, 2002 an Action Memorandum was signed describing a Removal Action to be performed at this site, which consists of covering the landfill with a 2-foot thick soil cover.

j. Construction of the Removal Action began in September 2002 and was completed in August 2003.

k. Long-Term Monitoring (LTM) contract awarded in September 2003. The first Long-Term Monitoring quarterly sampling event was conducted in March 2004.

l. The Final Record of Decision was signed in September 2004. The ROD was modified to state that the Removal Action was completed and incorporated any changes required by the resolution of the LUC issue between the EPA and the Navy.

8. Current Status: The site is currently in the Long-Term Monitoring Phase (beginning in 2004). Surface water monitoring was discontinued after the October 2007 sampling event, as per IHIRT decision. During the March 2011 partnering meeting, the IHIRT determined that a sufficient amount of groundwater sampling at Site 12 had been completed and the data showed stabilization of COC concentrations. Groundwater LTM sampling frequency was reduced from quarterly to once every 15 months. In addition, groundwater sample analyses were reduced from the *Maryland Solid Waste Tables 1 and 2* analytes to only [total and dissolved] arsenic, cobalt, iron, and manganese. Naphthalene analysis will continue in one well to confirm previous detections (MW10). The landfill cover/conditions and institutional controls are inspected during each LTM sampling event.

SITE 13 – PAINT SOLVENTS DISPOSAL GROUND

(OLD MAP GRID K31)
IRP Site 13
Fact Sheet

1. **Contamination:** Kerosene, mineral spirits, lacquer thinners, and solvents.

2. **Location:** 200-square-foot depressed area located 50 feet behind the Paint Shop, Building 870.

3. **From:** Dumping of thinners, solvents, and spent paint behind the building.

4. **When:** Between 1953 and 1979.

5. **Generated By:** Shop activities included painting various items by hand, using aerosol sprays, or in paint spray booths, and wastes were generated during paint equipment cleaning operations.

6. **Amount:** Up to 20,000 pounds of waste.

7. **Work Completed:**

   a. The site was identified in the Initial Assessment Study (IAS) of the Naval Assessment and Control of Installation Pollutants (NACIP) Program. NACIP is the former name of the Navy Installation Restoration Program (IRP), and the IAS is equivalent to the Preliminary Assessment (PA) portion of the IRP. The IAS recommended that a Confirmation Study not be performed for Site 13.

   b. Fieldwork for a Remedial Investigation (RI) was completed in 2000. Surface and subsurface soil samples were collected and analyzed for Target Compound List (TCL) volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), and Target Analyte List (TAL) metals. The Final RI report was completed in April 2004.

8. **Current Status:** A Record of Decision (ROD), which recommended no further action (NFA), was signed in September 2004.

SITE 14 – WASTE ACID DISPOSAL PIT

(OLD MAP GRID L33)
IRP Site 14
Fact Sheet

1. **Contamination:** Waste acids and other chemicals.

2. **Location:** 15- to 20-foot-deep disposal pit located 50 feet northeast of the Solvent Storehouse (Building 881) and 75 feet northwest of the Test Paper Manufacturing building (Building 444).

3. **From:** Dumping of waste acids and other chemicals.

4. **When:** Until 1975.

5. **Generated By:** Waste acids and other chemicals were collected from these and other buildings.

6. **Amount:** Unknown.

7. **Work Completed:**

   a. The site was identified in the Initial Assessment Study (IAS) of the Naval Assessment and Control of Installation Pollutants (NACIP) Program. NACIP is the former name of the Navy Installation Restoration Program (IRP), and the IAS is equivalent to the Preliminary Assessment portion of the IRP. The IAS recommended that a Confirmation Study not be performed for Site 14.

   b. The acid pit was believed to be found under the chemical disposal pit during the investigation of the Lab Area. In order to obtain samples from under the chemical disposal pit, it had to be removed, which revealed a concrete and brick structure resembling descriptions of the waste acid pit.

   c. The final Remedial Investigation Report for the Lab Area was completed in January 2004. No human health or ecological risks that require remediation were identified for Site 14; therefore, no further action (NFA) is planned for this site. A wetland delineation was completed in April 2006, and the final Baseline Ecological Risk Assessment Report was submitted in May 2006.

   d. A Focused Feasibility Study was completed in December 2009.

   e. A Proposed Plan was completed in April 2010, recommending soil excavation, Institutional Controls (ICs), and wetland restoration. A public meeting was held on April 15, 2010.

   f. The Record of Decision (ROD) was signed in September 2011.

   g. The Remedial Action Work Plan was finalized in November 2011 and remedial action activities finished in May 2012. The Construction Completion Report was finalized in May 2013.

8. **Current Status:** ICs are in place due to the unknown network of underground pipes that may contain mercury. The Remedial Action Completion Report (RACR) was finalized in July 2014.

SITE 15 – MERCURY DEPOSITS IN MANHOLE, FLUORINE LAB

(OLD MAP GRID L34)
IRP Site 15
Fact Sheet

1. **Contamination:** Mercury, lead, and oil/grease.

2. **Location:** Manhole located 100 feet from Building 502.

3. **From:** Disposal of laboratory wastewater into storm sewer.

4. **When:** 1942 to 1981.

5. **Generated By:** Wastewater from laboratory activities in Buildings 502 and 103.

6. **Amount:** Up to 1 pound of mercury and 64 pounds of lead.

7. **Work Completed:**

   a. The site was identified in the Initial Assessment Study (IAS) of the Naval Assessment and Control of Installation Pollutants (NACIP) Program. NACIP is the former name of the Navy Installation Restoration Program (IRP), and the IAS is equivalent to the Preliminary Assessment portion of the IRP. The IAS recommended that a Confirmation Study not be performed for Site 15.

   b. This site is included in the "Lab Area" grouping of sites. Remedial investigation (RI) fieldwork was completed at the Lab Area in 2001. Surface and shallow subsurface soil, sediment, and surface water samples were collected in the Lab Area and analyzed for Target Compound List (TCL) volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), Target Analyte List (TAL) metals, and an expanded list of explosives.

   c. The Final RI Report for the Lab Area was completed in January 2004. A wetland delineation was completed in April 2006, and the Final Baseline Ecological Risk Assessment (BERA) Report was submitted in May 2006.

   d. A Focused Feasibility Study (FS) was completed in December 2009.

   e. A Proposed Plan was completed in April 2010, recommending soil excavation, Institutional Controls (ICs), and wetland restoration. A public meeting was held on April 15, 2010.

   f. The Record of Decision (ROD) was signed in September 2011.

   g. The Remedial Action Work Plan was finalized in November 2011 and remedial action activities finished in May 2012. The Construction Completion Report was finalized in May 2013.

8. **Current Status:** ICs are in place due to the unknown network of underground pipes that may contain mercury. The Remedial Action Completion Report (RACR) was finalized in July 2014.

SITE 16 – LABORATORY CHEMICAL DISPOSAL

(OLD MAP GRID K34)
IRP Site 16
Fact Sheet

1. **Contamination:** Acids, amines (RNH_3), cyanide compounds, metals, and chlorinated and nonchlorinated solvents.

2. **Location:** Wastewater collection system within the Research and Development Building (Building 600).

3. **From:** Disposal of laboratory chemicals into wastewater system.

4. **When:** 1944 to present.

5. **Generated By:** Wastewater from laboratory activities in Building 600.

6. **Amount:** Unknown.

7. **Work Completed:**

   a. The site was identified in the Initial Assessment Study (IAS) of the Naval Assessment and Control of Installation Pollutants (NACIP) Program. NACIP is the former name of the Navy Installation Restoration Program (IRP), and the IAS is equivalent to the Preliminary Assessment (PA) portion of the IRP. The IAS recommended that a Confirmation Study not be performed for Site 16.

   b. This site is included in the "Lab Area" grouping of sites. Remedial investigation (RI) field work was completed at the Lab Area in 2001. Surface and shallow subsurface soil, sediment, and surface water samples were collected in the Lab Area and analyzed for Target Compound List (TCL) volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), Target Analyte List (TAL) metals, and an expanded list of explosives.

   c. The Final RI report for the Lab Area was completed in January 2004. A wetland delineation was completed in April 2006, and the final Baseline Ecological Risk Assessment report was submitted in May 2006.

   d. A Focused Feasibility Study (FS) was completed in December 2009.

   e. A Proposed Plan was completed in April 2010, recommending soil excavation, Institutional Controls (ICs), and wetland restoration. A public meeting was held on April 15, 2010.

   f. The Record of Decision (ROD) was signed in September 2011.

   g. The Remedial Action Work Plan was finalized in November 2011 and remedial action activities finished in May 2012. The Construction Completion Report was finalized in May 2013.

8. **Current Status:** ICs are in place due to the unknown network of underground pipes that may contain mercury. The Remedial Action Completion Report (RACR) was finalized in July 2014.

SITE 17 – DISPOSED METAL PARTS ALONG SHORELINE

(OLD MAP GRID M 6, 7, 8 and L 5)
IRP Site 17
Fact Sheet

1. **Contamination:** Rocket motor casings, shipping containers, empty drums, solvents, and various metal parts.

2. **Location:** A 1,000-foot stretch of shoreline east of the Decontamination Burning Point, along Mattawoman Creek and extending back approximately 100 feet from the shoreline in the wooded area near Building 1569.

3. **From:** Disposal of metal parts and drums in the adjacent wooded area.

4. **When:** From 1960 to about 1980.

5. **Generated By:** Disposal of metal parts and drums in the adjacent wooded area.

6. **Amount:** Unknown.

7. **Work Completed:**

   a. The site was identified in the Initial Assessment Study (IAS) of the Naval Assessment and Control of Installation Pollutants (NACIP) Program. NACIP is the former name of the Navy Installation Restoration Program (IRP), and the IAS is equivalent to the Preliminary Assessment (PA) portion of the IRP. The IAS recommended that a Confirmation Study not be performed for Site 17.

   b. Initial Remedial Investigation (RI) fieldwork was completed in 2000. Surface soil, subsurface soil, sediment, surface water, and groundwater samples were collected in the metal parts and drum disposal areas and analyzed for Target Compound List (TCL) volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), Target Analyte List (TAL) metals, and an expanded list of explosives.

   c. Pre-Feasibility Study (FS) field investigation activities were conducted in 2002. Groundwater and surface water samples were collected and analyzed for TCL VOCs.

   d. Exposed drums located throughout the site were removed in April 2003.

   e. The RI Report was finalized in January 2004. The RI recommended an FS for groundwater.

   f. An Engineering Evaluation and Cost Analysis (EE/CA), which discussed source removal options, was completed in August 2004.

   g. A revised final Work Plan for additional investigation of groundwater was completed in February 2005, and sampling was conducted in March 2005.

   h. The Baseline Ecological Risk Assessment (BERA) Report was finalized in June 2005.

   i. A soil interim removal action (IRA) was completed in February 2006.

   j. The FS was completed in October 2008.

k. A Proposed Plan was completed in February 2009, and recommended removal of munitions items, groundwater treatment, long-term monitoring for groundwater, and institutional controls. A public meeting was held on February 19, 2009.

l. The Final Record of Decision (ROD) was signed in January 2010.

m. The remedial action activities to clear munitions and explosives of concern (MEC) and remove non-MEC debris along the shoreline were completed in October 2012. The Completion Report for this phase of the remedial action was finalized in June 2013.

n. The remedial action Pilot Study (zero-valent iron [ZVI] soil mixing) was completed in December 2012. Additional ZVI soil mixing may not be needed (to be determined by groundwater long-term monitoring [LTM]). The Pilot Study Completion Report (i.e., Soil Mixing Completion Report) was completed in June 2013. The Final Annual Monitoring Report was completed in June 2014. The Remedial Action Completion Report (RACR) for the soil mixing remedy component was finalized in May 2015.

8. Current Status: The site is currently in the RA-O phase. Post-ZVI soil mixing groundwater LTM began following the Pilot Study completed in December 2012. Sampling has been conducted quarterly since that time. Groundwater LTM results will be used to determine if additional ZVI soil mixing is necessary. Institutional Controls (ICs) have been implemented as part of the remedial action. An investigation of the north plume and an ESTCP demonstration project are planned for the fall of 2015.

SITE 18 – HOG ISLAND

(OLD MAP GRID M20)
IRP Site 18
Fact Sheet

1. **Contamination:** Grit and sludge.

2. **Location:** 1.8-acre site situated 600 feet southwest of Building 474, near Atkins Road.

3. **From:** Depositing grit/sludge in the marshy area near Hog Island.

4. **When:** Unknown.

5. **Generated By:** Sewage treatment plant grit chambers, primary tanks, or sludge drying beds.

6. **Amount:** Unknown.

7. **Work Completed:** The site was identified in the Initial Assessment Study (IAS) of the Naval Assessment and Control of Installation Pollutants (NACIP) Program. NACIP is the former name of the Navy Installation Restoration Program (IRP), and the IAS is equivalent to the Preliminary Assessment (PA) portion of the IRP. The IAS recommended that a Confirmation Study not be performed for Site 18.

8. **Current Status:** A Site Screening Process (SSP) investigation started in September 2004. The final SSP Report was submitted in August 2006, and a Decision Document which recommended no further action (NFA) was signed at the same time.

SITE 19 – CATCH BASINS AT CHIP COLLECTION HOUSES

(OLD MAP GRID M26 AND M28)
IRP Site 19
Fact Sheet

1. **Contamination:** Wastewater contaminated with lead and copper salts.

2. **Location:** Catch basins of the Chip Collection Houses (Buildings 1051 and 785).

3. **From:** Wastewater contaminated with lead and copper salts.

4. **When:** Unknown.

5. **Generated By:** Wastewater generated from the Chip Collection Houses (Building 1051 and 785).

6. **Amount:** Unknown.

7. **Work Completed:**

   a. The site was identified in the Initial Assessment Study (IAS) of the Naval Assessment and Control of Installation Pollutants (NACIP) Program. NACIP is the former name of the Navy Installation Restoration Program (IRP), and the IAS is equivalent to the Preliminary Assessment (PA) portion of the IRP. The IAS recommended that a Confirmation Study not be performed for Site 19.

   b. Site Screening Process (SSP) investigation started in April 2004. Additional sampling was completed in July 2007, July 2008, and December 2008. The final SSP Report was submitted in June 2009 and recommended a surface and subsurface removal.

   c. The Final Engineering Evaluation and Cost Analysis (EE/CA), which evaluated potential removal options, was finalized in September 2010. The Final Action Memorandum documenting the decision to perform a Removal Action was issued by the Navy in January 2011.

   d. The Final Removal Action Work Plan was submitted in February 2011.

   e. The removal of contaminated soil was completed in April 2011 and final restoration of the site was completed in October 2011.

   f. The final Construction Completion Report was submitted in September 2012.

8. **Current Status:** A Decision Document recommending No further action (NFA) at the site was finalized and signed by the Navy and EPA, with concurrence from MDE, in October 2012.

SITE 20 – SINGLE-BASE POWDER FACILITIES

(OLD MAP GRID M35 to N33)
IRP Site 20
Fact Sheet

1. **Contamination:** Suspected polychlorinated biphenyls (PCBs).

2. **Location:** Single-base Powder Facilities.

3. **From:** Leaks from PCBs from transformer switches.

4. **When:** Circa 1940s.

5. **Generated By:** PCBs from transformer switches.

6. **Amount:** Unknown.

7. **Work Completed:** The site was identified in the Initial Assessment Study (IAS) of the Naval Assessment and Control of Installation Pollutants (NACIP) Program. NACIP is the former name of the Navy Installation Restoration Program (IRP), and the IAS is equivalent to the Preliminary Assessment (PA) portion of the IRP. The IAS recommended that a Confirmation Study not be performed for Site 20.

8. **Current Status:** A Site Screening Process investigation was started in 2004. However, review of existing information led to the signing of a Decision Document in February 2005, which recommended no further action (NFA).

SITE 21 – BRONSON ROAD LANDFILL

(OLD MAP GRID N21 AND O21)
IRP Site 21
Fact Sheet

1. **Contamination:** Solid waste including various quantities of paint sludges, asbestos, barium sulfate, zinc, and lead.

2. **Location:** 2-acre abandoned borrow pit located near the terminus of Bronson Road, directly across the street from Building 1384.

3. **From:** Dumping of solid waste from facilities in the explosives manufacturing area.

4. **When:** Between 1975 and 1982.

5. **Generated By:** Solid waste from facilities in the explosives manufacturing area.

6. **Amount:** Up to 1500 tons of solid waste, 2.5 tons of barium sludge, 3.3 tons of asbestos, and 3 tons of paint sludge.

7. **Work Completed:**

   a. The site was identified in the Initial Assessment Study (IAS) of the Naval Assessment and Control of Installation Pollutants (NACIP) Program. NACIP is the former name of the Navy Installation Restoration Program (IRP), and the IAS is equivalent to the Preliminary Assessment (PA) portion of the IRP. The IAS recommended that a Confirmation Study not be performed for Site 21.

   b. Initial remedial investigation (RI) fieldwork was completed in 2000. Surface soil and groundwater samples were collected and analyzed for Target Compound List (TCL) volatile organic compounds, TCL semivolatile organic compounds (SVOCs), Target Analyte List (TAL) metals, and an expanded list of explosives.

   c. An additional pre-feasibility study field investigation was conducted in 2002. Groundwater samples were collected and analyzed for TCL VOCs, TAL metals, and explosives.

   d. The installation and sampling of monitoring wells was completed in January 2003. High detections of perchlorate were found in MW 04. It was later determined that the perchlorate is not associated with the landfill based on probable groundwater flow direction and that the source is off site.

   e. The final RI Report was completed in April 2004, and the final Baseline Ecological Risk Assessment Report was submitted in July 2005.

   f. Fieldwork for a groundwater manganese investigation was completed in June 2006. The results of the investigation were incorporated into the final Feasibility Study report which was submitted in September 2006.

   g. Additional investigation was performed in 2008 to determine whether manganese in groundwater occurs from a natural source. Results were documented in a Technical Memorandum that was submitted in March 2009.

h. The Proposed Plan, which recommended the installation of a soil cover, was finalized in June 2010. The public meeting was held on July 1, 2010.

i. The Record of Decisions (ROD) was signed in September 2011.

j. A 100% Remedial Design was submitted in January 2012.

k. A final Remedial Action Work Plan was submitted in June 2012.

l. A final LUC Remedial Design and Long Term Monitoring (LTM) Plan were submitted in June 2012. The Remedial Action field work was completed in January 2013. A Final Construction Closeout Report was completed in February 2014. A Remedial Action Completion Report (RACR) was completed in June 2014.

8. Current Status: Site 21 groundwater is in the LTM phase currently on a semiannual sampling frequency. Groundwater samples are analyzed in accordance with *Maryland Solid Waste Tables 1 and 2*. The landfill cover/conditions and ICs are inspected during each LTM sampling event.

SITE 22 / UXO 6 – NG SLUMS BURNING SITE

(OLD MAP GRID O12)
IRP Site 22 / MRP Site UXO 6
Fact Sheet

1. **Contamination:** Nitroglycerin slums.

2. **Location:** 50-foot-wide strip along the shoreline of the Greenslade Road Peninsula and Mattawoman Creek.

3. **From:** Spills of nitroglycerin slums during burning.

4. **When:** Late 1940s until 1953.

5. **Generated By:** Nitroglycerin slums from nitroglycerin plant production.

6. **Amount:** Unknown.

7. **Work Completed:**

   a. The site was identified in the Initial Assessment Study (IAS) of the Naval Assessment and Control of Installation Pollutants (NACIP) Program. NACIP is the former name of the Navy Installation Restoration Program (IRP), and the IAS is equivalent to the Preliminary Assessment (PA) portion of the IRP. The IAS recommended that a Confirmation Study not be performed for Site 22.

   b. The final PA report was completed in September 2005.

   c. The Site Inspection was completed in September 2010 and recommended no further action (NFA) in surface soil and subsurface soil. However, due to the presence of explosives (specifically NG) in groundwater, it was recommended that a Remedial Investigation for groundwater be performed.

8. **Current Status:** Currently designated as MRP Site UXO 006. A Remedial Investigation (RI) for munitions constituents in the groundwater will begin when funding becomes available.

SITE 23 – HYDRAULIC OIL DISCHARGES FROM EXTRUSION PLANT

(OLD MAP GRID P24)
IRP Site 23
Fact Sheet

1. **Contamination:** Hydraulic oil.

2. **Location:** Press lines (Buildings 561 and 564).

3. **From:** Discharge of wastewater containing hydraulic oil to the Mattawoman Creek via IW18.

4. **When:** 1943 until 1981.

5. **Generated By:** Wastewater used to cool pumps and press dies**.**

6. **Amount:** Unknown.

7. **Work Completed:**

   a. The site was identified in the Initial Assessment Study (IAS) of the Naval Assessment and Control of Installation Pollutants (NACIP) Program. NACIP is the former name of the Navy Installation Restoration Program (IRP) and the IAS is equivalent to the Preliminary Assessment (PA) portion of the IRP. The IAS recommended that a Confirmation Study not be performed for Site 23.

   b. Site Screening Process (SSP) investigation started in April 2004. The final Work Plan was completed in February 2005, and sampling was completed in May 2005.

8. **Current Status:** The final SSP Report was submitted in February 2006, and a Decision Document, which recommended no further action (NFA), was signed in March 2006.

SITE 24 – ABANDONED DRAIN LINES

(OLD MAP GRID O35, 37, 38)
IRP Site 24
Fact Sheet

1. **Contamination:** Acid water and nitrocellulose (NC) white water.

2. **Location:** Abandoned drain lines from former NC production facilities.

3. **From:** Discharge of neutralized acid water and NC white water to Mattawoman Creek.

4. **When:** Unknown.

5. **Generated By:** Production of NC, which used cotton liners, nitric acid, and sulfuric acid. NC, which is practically insoluble in water, may have deposited in abandoned drain lines located near the old NC Plant site.

6. **Amount:** Unknown.

7. **Work Completed:**

   a. The site was identified in the Initial Assessment Study (IAS) of the Naval Assessment and Control of Installation Pollutants (NACIP) Program. NACIP is the former name of the Navy Installation Restoration Program (IRP), and the IAS is equivalent to the Preliminary Assessment (PA) portion of the IRP. The IAS recommended that a Confirmation Study not be performed for Site 24.

   b. A Site Screening Process (SSP) investigation started in September 2004. In 2005 through 2007, IHIRT recognized physical explosive hazards from residues versus toxicity issues from site contaminants. A Decision Document, which recommended no further action (NFA) under CERCLA, but included safety controls via the NSFIH work permit process (already in place), was signed in April 2007.

   c. A Desktop Audit was prepared in 2014. The review suggested updating the Site 57 Long-Term Monitoring Plan to include diphenylamine, which now has toxicity values. IRP Site 24 should be transferred to the Munitions Response Program (MRP) and undergo a PA or Site Investigation (SI), per Navy MRP policy.

8. **Current Status:** The Desktop Audit Tech Memo in 2014 recommended a PA/SI after the IRP Site 24 is transitioned to the MRP. When funding is available, Navy will proceed with a PA/SI per Navy MRP policy. In the meantime, the work permitting process at NSFIH provides worker notification and safety checks prior to any work in the area.

SITE 25 – HYPO DISCHARGES FROM X-RAY BUILDING NO. 2

(OLD MAP GRID P27)
IRP Site 25
Fact Sheet

1. **Contamination:** Silver from spent fixer and developer.

2. **Location:** Drainage swales behind Building 588, which flow to the Mattawoman Creek.

3. **From:** Discharge of spent fixer and developer for X-Ray film.

4. **When:** 1944 to 1964.

5. **Generated By:** Fixer and developer are used to develop X-Ray film. Some of the silver, which is on the film, becomes "fixed" to the X-Ray, and the remainder of the silver is washed off. Both the spent fixer and washwater, which contain silver, were discharged behind Building 588 and into IW46.

6. **Amount:** Estimated 864 pounds of silver.

7. **Work Completed:**

   a. The site was identified in the Initial Assessment Study (IAS) of the Naval Assessment and Control of Installation Pollutants (NACIP) Program. NACIP is the former name of the Navy Installation Restoration Program (IRP), and the IAS is equivalent to the Preliminary Assessment (PA) portion of the IRP. The IAS recommended that a confirmation study be conducted at Site 25 if the study at Site 5 indicated a danger to aquatic life.

   b. Initial Remedial Investigation (RI) fieldwork was completed in 2000. Surface soil, shallow subsurface soil, and groundwater samples were collected and analyzed for Target Compound List (TCL) volatile organic compounds, TCL semivolatile organic compounds (SVOCs), Target Analyte List (TAL) metals, and nitroglycerin.

   c. Additional RI sampling was conducted in 2002. Groundwater samples were collected and analyzed for TAL metals.

8. **Current Status:** The final RI Report was completed in April 2004. A Record of Decision, which recommended no further action (NFA), was signed in September 2004.

SITE 26 – THERMAL DESTRUCTOR 2

(OLD MAP GRID P30)
IRP Site 26
Fact Sheet

1. **Contamination:** Hydrazine fuel and unsymmetrical dimethyl hydrazine (UDMH)-contaminated water.

2. **Location:** Thermal Destructor 2 facility (Building 1595).

3. **From:** Spills of hydrazine- and UDMH-contaminated water at the incinerator.

4. **When:** 1976 until 1978.

5. **Generated By:** Thermal destruction of hydrazine- and UDMH-contaminated water.

6. **Amount:** 1.3 million pounds per year of hydrazine- and UDMH-contaminated water was treated in the incinerator. An unknown quantity of this wastewater may have spilled in the vicinity of the site.

7. **Work Completed:** The site was identified in the Initial Assessment Study (IAS) of the Naval Assessment and Control of Installation Pollutants (NACIP) Program. NACIP is the former name of the Navy Installation Restoration Program (IRP) and the IAS is equivalent to the Preliminary Assessment (PA) portion of the IRP. The IAS recommended that a Confirmation Study not be performed for Site 26. Site Screening Process (SSP) investigation started in April 2004. Sampling was completed in October 2005. The SSP Report was submitted in September 2006

8. **Current Status:** A Decision Document, which recommended no further action (NFA), was signed in September 2006.

SITE 27 – THERMAL DESTRUCTOR 1

(OLD MAP GRID S32)
IRP Site 27
Fact Sheet

1. Contamination: Hydrazine-contaminated water.

2. Location: Thermal Destructor 1 facility (Building 1584).

3. From: Spills of hydrazine-contaminated water at the incinerator.

4. When: 1976 until 1979.

5. Generated By: Thermal destruction of hydrazine-contaminated water.

6. Amount: 1.3 million pounds per year of hydrazine-contaminated water was treated in the incinerator. An unknown quantity of this wastewater may have spilled in the vicinity of the site.

7. Work Completed:

a. The site was identified in the Initial Assessment Study (IAS) of the Naval Assessment and Control of Installation Pollutants (NACIP) Program. NACIP is the former name of the Navy Installation Restoration Program (IRP), and the IAS is equivalent to the Preliminary Assessment (PA) portion of the IRP. The IAS recommended that a Confirmation Study not be performed for Site 27.

b. Site Screening Process (SSP) investigation started in April 2004. Sampling was completed in October 2005. Additional sampling was completed in July 2007 and August 2008. The final SSP Report was submitted in June 2009

c. The EE/CA was finalized in September 2010. The Final Action Memorandum was issued by the Navy in January 2011.

d. The Final Removal Action Work Plan was submitted in February 2011, and the Removal Action was completed in November 2011.

e. The final Construction Completion Report was submitted in September 2012.

8. Current Status: A Decision Document recommending No further action (NFA) at the site was finalized and signed by the Navy and EPA, with concurrence from MDE, in October 2012.

SITE 28 / UXO 8 – ORIGINAL BURNING GROUND

(OLD MAP GRID S36, 37)
IRP Site 28 / MRP Site UXO 8
Fact Sheet

1. **Contamination:** Smokeless powder and zinc.

2. **Location:** 1.8-acre site on southeastern corner of base along Mattawoman Creek.

3. **From:** Open burning of materials and operation of a zinc recovery furnace.

4. **When:** Burning estimated between 1890 and 1942; zinc recovery estimated between 1928 and the mid-1950s.

5. **Generated By:** Burning of waste materials from base manufacturing, and residual contamination from the zinc recovery process.

6. **Amount:** Unknown.

7. **Work Completed:**

   a. The site was identified in the Initial Assessment Study (IAS) of the Naval Assessment and Control of Installation Pollutants (NACIP) Program. NACIP is the former name of the Navy Installation Restoration Program (IRP), and the IAS is equivalent to the Preliminary Assessment (PA) portion of the IRP. The IAS recommended that a Confirmation Study not be performed for Site 28.

   b. Soil samples were collected at the site in 1993 and analyzed for soil texture, pH, and fertility. Elevated levels of zinc were detected.

   c. Sampling off shore of this site was performed during the Toxicity Identification Evaluation Study in 2000 and the Mattawoman Creek Study in 2001. Both studies confirmed elevated levels of zinc in the sediment.

   d. The Remedial Investigation (RI) fieldwork began in May 2003. Additional monitoring wells were installed in August 2003.

   e. The RI Report for the zinc recovery furnace area was completed in April 2005. The zinc recovery furnace area remained under the IRP as Site 28, whereas the original burning area was transferred to the Munitions Response Program (MRP) as Site UXO 008.

   f. A pilot study evaluating the use of apatite (a natural form of calcium phosphate mineral) to stabilize metals in Site 28 [Mattawoman Creek] sediment began in June 2004.

   g. . A Preliminary Assessment (PA) Report was completed in September 2005 under the MRP for the original burning ground (UXO 008). The report recommended no further action (NFA) for UXO 008.

   h. The Final Baseline Ecological Risk Assessment Report and Final Engineering Evaluation and Cost Analysis (EE/CA) both were submitted in September 2006.

i. An interim removal action (IRA) for soil at the zinc recovery furnace area (Site 28) was completed in November 2008.

j. A Focused Feasibility Study for groundwater was finalized in March 2010.

k. The Final Proposed Plan for Site 28 was finalized in August 2013. No further action (NFA) was proposed for surface soil, subsurface soil, sediment, and surface water. The Preferred Remedy for groundwater is long-term monitoring (LTM) and land use controls (LUCs). A public meeting was held on August 21, 2013. The Final Record of Decision (ROD) was signed in June 2014.

8. Current Status: The Land Use Control Remedial Design was finalized in May 2015.

SITE 29 / UXO 11 – THE VALLEY

(OLD MAP GRID A37, B37, C37)
IRP Site 29 / MRP Site UXO 11
Fact Sheet

1. Contamination: Exploded ordnance.

2. Location: Naturally occurring valley along Torrence Road for 0.5 mile beginning at the Potomac River, northwest of Building 54.

3. From: Firing of shells into butts in the valley walls.

4. When: From 1891 to 1921.

5. Generated By: Firing of shells into butts in the valley walls.

6. Amount: Unknown.

7. Work Completed:

a. The site was identified in the Initial Assessment Study (IAS) of the Naval Assessment and Control of Installation Pollutants (NACIP) Program. NACIP is the former name of the Navy Installation Restoration Program (IRP), and the IAS is equivalent to the Preliminary Assessment (PA) portion of the IRP. The IAS recommended that a Confirmation Study not be performed for Site 29.

b. A preliminary assessment was started in June 2003. The final PA Report was completed in September 2005.

c. A Site Inspection was completed in September 2010 and recommended the site move forward to a Remedial Investigation (RI) for munitions and explosives of concern (MEC) and munitions constituents (MC) in soil and groundwater.

d. A final RI UFP-SAP Work Plan (and Explosive Safety Submission [ESS] Determination Request) for DGM survey fieldwork was completed in November 2012. An ESS for intrusive investigation of anomalies was finalized in October 2013.

8. Current Status: Currently designated as MRP Site UXO 0011. Remedial Investigation fieldwork (intrusive investigation of anomalies) was completed in June 2014. A Draft Remedial Investigation Report was submitted in March 2015 and is currently under review. A BERA is planned for 2016.

SITE 39 – SILVER RELEASE TO SEDIMENTS

(OLD MAP GRID P29)
IRP Site 39
Fact Sheet

1. **Contamination:** Elemental silver and possibly silver nitrate, dinitropropanol, ethylene dichloride, methyl chloride, formaldehyde, unsymmetrical dimethylhydrazine (UDMH), and nitroguanidine (NQ).

2. **Location:** Area surrounding Building 497.

3. **From:** Production of bis-2,2-dinitropropyl acetal/formal and explosives.

4. **When:** Releases to Mattawoman Creek 1961 to 1965; stack emissions 1942 to 1994.

5. **Generated By:** Release of silver and silver nitrate during production of acetal/formal. Silver nitrate was used as a catalyst in the production of acetal/formal, a plasticizer, or propellant binder, used in Polaris rocket motors. In the reaction, the silver nitrate catalyst was converted to elemental silver. The silver was recovered from the reaction vessel and returned to the supplier to undergo nitration back to silver nitrate. However, interviews with Navy personnel revealed that a significant amount of silver, as well as the other chemicals listed above, may have entered the creek through spills and human error, such as valves mistakenly left open. Additional releases may have occurred from the stacks on Buildings 497 and 498. Emissions from these stacks may have contaminated surface soil in the surrounding areas, however the quantity of contaminants that may have been discharged is unknown.

6. **Amount:** Unknown.

7. **Work Completed:**

   a. A Site Inspection (SI) under the Navy Installation Restoration Program (IRP) was conducted as recommended by the Preliminary Assessment (PA) to determine if contamination is actually present. This inspection included taking four ponar grab samples from the top sediment of Mattawoman Creek and two sediment samples in the creek near Industrial Wastewater Outfall 05 (IW05). These samples were analyzed for acetal/formal, pelletized nitrocellulose, unsymmetrical dimethyl hydrazine, high bulk density nitroguanidine, Target Compound List (TCL) volatile organic compounds, and TCL semivolatile organic compounds (SVOCs). Subsequent investigation of the sediments near IW05 was conducted under the Mattawoman Creek study.

   b. Because the site inspection did not address potential stack emissions, a Remedial Investigation (RI) began at Site 39. RI fieldwork was completed in 2001. Surface and shallow subsurface soil samples were collected and analyzed for TCL SVOCs, Target Analyte List (TAL) metals, and an expanded list of explosives.

   c. The final RI report was completed in April 2004 and recommended no further action (NFA) for this site.

8. **Current Status:** A Record of Decision (ROD), which recommended NFA, was signed in September 2005.

SITE 40 – PALLADIUM CATALYST IN SEDIMENT

(OLD MAP GRID P29)
IRP Site 40
Fact Sheet

1. **Contamination:** Palladium.

2. **Location:** Mattawoman Creek southeast of Building 497.

3. **From:** Production of Unsymmetrical-Dimethylhydrazine (UDMH).

4. **When:** 1974 and 1975.

5. **Generated By:** Release of palladium, a catalyst used in the production of UDMH. Forty percent of the catalyst purchased was lost and cannot be accounted for. Therefore, it is possible that this catalyst entered Mattawoman Creek.

6. **Amount:** Based on the 40 percent estimated loss of the total palladium purchased, the total amount of palladium that may have entered the creek is 88 pounds.

7. **Work Completed:**

   a. A Preliminary Assessment (PA) was performed ,but a Site Inspection (SI) was not recommended under the Navy Installation Restoration Program (IRP), because palladium is not a regulated hazardous substance. However, the SI was performed to ensure that a problem does not exist. This inspection included taking four ponar grab samples from the top sediment of Mattawoman Creek and two sediment samples in the Creek near the wastewater outfall, which is no longer in use. These samples were analyzed for palladium.

   b. In January 2004, the site was re-assigned as a Site Screening Area (SSA).

8. **Current Status:** In April 2004, a Desktop Evaluation was signed by the Navy and EPA with concurrence from MDE, which recommended no further action (NFA).

SITE 41 / UXO 32 – SCRAP YARD

(OLD MAP GRID R31, S31)
IRP Site 41 / MRP Site UXO 32
Fact Sheet

1. **Contamination:** Arsenic, iron, lead, and polychlorinated biphenyls (PCBs).

2. **Location:** Scrap yard west of Building 436.

3. **From:** Storage of coal, scrap / discarded materials, lead-acid batteries, and PCB and PCB-contaminated transformers. By definition, PCB transformers contain oil with greater than 500 parts per million (ppm) of PCBs, and PCB-contaminated transformers contain oil within 50 to 500 ppm PCBs.

4. **When:** From the 1960s to 1988.

5. **Generated By:** Before Building 1440 was dedicated to the storage of removed PCB equipment, transformers containing PCBs were stored at the Scrap Yard. Transformers, some in poor condition, which leaked PCB oil on the ground, were stored at the northwestern end of the Scrap Yard near Mattawoman Creek. Coal and lead-acid batteries also were stored in the Scrap Yard, along with various scrap materials.

6. **Amount:** Unknown.

7. **Work Completed:**

   a. A Site Inspection (SI) under the Navy Installation Restoration Program (IRP) was conducted as recommended in the Preliminary Assessment (PA) to determine if contamination is actually present. Soil and groundwater samples along with sediment samples from Mattawoman Creek were collected and analyzed for Target Compound List (TCL) organics, Target Analyte List (TAL) metals, and total petroleum hydrocarbons (TPH).

   b. A Remedial Investigation (RI) Report for Site 41 was completed in July 1999. The report determined that the human health risk for non-residential scenarios is within acceptable limits, with the exception of the full-time worker. The document identified a potential ecological risk in connection with surface soil contamination. The document recommended a feasibility study report to evaluate alternatives to address the full-time worker and ecological risks.

   c. A Feasibility Study (FS) was completed in January 2001. The study developed a potential remedial alternative requiring removal of contaminated soil from areas adjacent to the Scrap Yard, the removal of contaminated soil from within the Scrap Yard, and the remediation of contamination on the concrete slab within the Scrap Yard, all in combination with institutional controls.

   d. A Proposed Plan was completed in February 2001. The preferred remedial alternative presented in the document provided for the removal of contaminated soil from areas adjacent to the Scrap Yard, the removal of contaminated soil from within the Scrap Yard, and the remediation of contamination on the concrete slab within the Scrap Yard, all in combination with institutional controls.

   e. A public meeting was held on February 20, 2001 to present the Proposed Plan to the public.

f. Completion of the final design documents occurred in August 2002. The RD, intended for the anticipated Selected Remedy, was used to implement a CERCLA response under the Navy's removal action authority (see below).

g. Due to unresolved issues related to Land Use Controls (LUCs) between the EPA and the Navy with respect to Records of Decision (RODs), an Engineering Evaluation and Cost Analysis (EE/CA) was prepared in June 2002. On June 27, 2002, an Action Memorandum was signed describing an Interim Removal Action (IRA) to be performed at this site, which consists of removing contaminated soil from within the Scrap Yard as well as from outside the Scrap Yard.

h. Construction of the IRA began in November 2002, but was halted due to an incident involving scrap metal at the site.

i. Due to the discovery of numerous ordnance and explosive (OE) items, the site was transferred to the MRP in March 2004 and designated as Site UXO 032.

i. The first phase of the removal action and remediation began in September 2006. Removal of all large potentially explosive items was completed in March 2007.

j. A final Remedial Action Work Plan (including a final Explosive Safety Submission) was completed in April 2010.

k. The second phase of the removal action was completed in May 2011, closing out the soil medium for the site. Additional monitoring wells were installed to continue groundwater characterization.

l. The RI UFP-SAP Work Plan for groundwater was finalized in June 2011. Groundwater samples were collected from new and existing monitoring wells in June 2011.

m. The final Construction Completion Report for the IRA was submitted in August 2011

n. A revised baseline Human Health Risk Assessment (HHRA) was finalized in February 2012. It incorporated the June 2011 groundwater data and post-removal action soil data considerations. The results indicated no risks to current industrial users from exposure to soil. Potential unacceptable risks remain from residential and construction worker exposure to soil. Groundwater contamination also poses a potential risk to future receptors. The groundwater results from 2011 showed elevated contaminant concentrations upgradient of the Scrap Yard.

o. Following submittal of a new Draft Proposed Plan (for both groundwater and soil at UXO 32) in December 2011, the IHIRT further evaluated the revised HHRA results and the elevated upgradient groundwater contaminant (e.g., TCE) concentrations. Because the groundwater contamination appears to originate upgradient (offsite), the IHIRT determined additional groundwater investigation was necessary. In order for the Proposed Plan for the soil medium at IRP Site 41 / MRP Site UXO 32 to move forward, the IHIRT agreed that groundwater would be addressed separately by additional investigation as a new site. The groundwater operable unit has been assigned as new IRP Site 70.

p. A Focused FS was submitted in July 2013 to summarize the site history, action(s), and decision(s) since the 2001 FS. The Focused FS evaluated a Land Use Control (LUC) alternative, considering the IRA mitigated risks at the site under current industrial exposure conditions.

q. The Final Proposed Plan was completed in August 2013. No action is proposed for sediment and surface water. The Preferred Remedy for soil is LUCs. A public meeting was held on August 21, 2013. The Final Record of Decision (ROD) was signed in June 2014.

r. The Final Remedial Action Completion Report (RACR) and LUC Remedial Design were completed in January 2015.

8. Current Status: LUCs are in place at the site for soil. Groundwater is being addressed as new IRP Site 70.

SITE 42 – OLSEN ROAD LANDFILL

(OLD MAP GRID G5, G6)
IRP Site 42
Fact Sheet

1. **Contamination:** Unknown.

2. **Location:** Near Building 1866.

3. **From:** Disposal of various solid wastes from all over the base.

4. **When:** A period of approximately 5 years ending in 1987.

5. **Generated By:** Normal operations. Whether hazardous wastes were disposed at the landfill cannot be confirmed or denied by activity records or personnel. Analysis of the former topography suggests that earth-moving equipment was used to fill the area.

6. **Amount:** Unknown.

7. **Work Completed:**

   a. A Site Inspection (SI) was performed under the Navy Installation Restoration Program (IRP), as recommended in the Preliminary Assessment (PA). Soil, groundwater, sediment, and surface water samples were collected and analyzed for volatile organic compounds (VOCs), Target Compound List (TCL) organics, Target Analyte List (TAL) metals, and total petroleum hydrocarbons (TPH).

   b. A Remedial Investigation (RI) Report for Site 42 was completed in July 1999. The report determined that the human health risk for non-residential scenarios is within acceptable limits. The potential for ecological risks was identified in connection with a small creek running along the downgradient, southwestern edge of the site. An additional issue focused on the need to close the landfill in accordance with Maryland regulations.

   c. In December 1999, a toxicity study of the sediments in the above-described creek was completed. Sediment contaminants detected during the RI were found to not exhibit toxicity.

   d. The Feasibility Study (FS) was completed in June 2002. The study developed several potential remedial alternatives, including one requiring total landfill removal and others involving various capping scenarios combined with institutional controls.

   e. The final Remedial Design was completed in March 2005.

   f. The Record of Decision (ROD) was signed by the Navy and EPA in September 2005.

   g. The remedial action, construction of a landfill cap, was completed in June 2006.

   h. Surface water monitoring was discontinued after the October 2007 sampling event, as per IHIRT decision.

8. **Current Status:** This site is currently in Long-term Monitoring. During the February 2012 partnering meeting, the IHIRT determined that a sufficient amount of groundwater sampling at Site 42 has been completed and the COCs have stabilized. Groundwater sampling was reduced from quarterly to

once every 9 months. Groundwater is tested for all the *Maryland Solid Waste Tables 1 and 2* analytes.

SITE 43 – TOLUENE DISPOSAL

(OLD MAP GRID D8)
IRP Site 43
Fact Sheet

1. **Contamination:** Acetone and toluene.

2. **Location:** a) Near utility pole across the street from Building 1041 and b) the northern corner of Building 1040.

3. **From:** Disposal of acetone and toluene used for propellant removal at Building 1041 and disposal of acetone used for propellant removal at Building 1040.

4. **When:** Parts cleaning operations took place from the late 1950s through November 1989 at Building 1041 and from 1960 to 1989 at Building 1040. It is estimated that, for a period of more than two years during the operation, spent solvent was improperly disposed at the base of the pole by Building 1041 and in the drainage ditch outside the door of Building 1040.

5. **Generated By:** After parts were cleaned within Buildings 1040 and 1041, the spent solvent was normally combined or "slummed" with sawdust in a 55-gallon drum for treatment at the Strauss Avenue Thermal Treatment Point. Occasionally, however, the spent solvent was carried across the street from Building 1041 to the utility pole and poured on the ground at the base of the pole and in the ditch outside the door of Building 1040.

6. **Amount:** One report estimated that 15 to 20 gallons per week of spent solvent were disposed at the base of the pole. It was not possible to determine the amount of solvent disposed at this site. In addition, acetone was reportedly sometimes poured in the ditch outside the door of Building 1040.

7. **Work Completed:**

   a. A Preliminary Assessment (PA) was performed and a Site Inspection (SI) was recommended under the Navy Installation Restoration Program (IRP) to determine if contamination is actually present.

   b. An SI under the Navy IRP was conducted at the base of the utility pole across the street from Building 1041. This inspection included obtaining 10 soil-gas samples from 10 borings and analyzing for volatile organic compounds (VOCs). In addition, four soil samples were taken using a hand auger at a depth not greater than 3 feet for analysis VOCs, base-neutral acids (BNAs), and total petroleum hydrocarbons (TPH).

   c. Additional sampling was recommended in the SI. The Site Screening Process (SSP) investigation started in April 2004 and included taking samples from both the Building 1040 and 1041 areas. The Draft SSP report was submitted in December 2005. Additional sampling was planned prior to finalizing the report.

   d. The Phase 1 Supplemental SSP investigation was completed in November 2007. Additional (Phase 1A) sampling was completed in February 2009. Rather than continuing with Phase 2 Supplemental SSP, IHIRT decided that the site should enter the RI/FS phase. Therefore, SSP results through Phase 1A were documented in a final SSP Report in October 2009.

   e. The RI UFP-SAP Work Plan was finalized in March 2011. The initial RI fieldwork was completed in June 2011; however, data gaps were identified, necessitating an additional

phase of RI fieldwork. The Phase 2 RI UFP-SAP Work Plan Addendum was submitted in April 2012.

f. An Interim Summary Report for the Phase 1 RI Results was submitted in April 2012 along with the SAP addendum. The Phase 2 RI field work was completed in July 2013. The RI Report was finalized in October 2014.

8. Current Status: A Draft Feasibility Study Report was submitted in March 2015 and is on hold until completion of a pre-design investigation for cobalt in groundwater.

SITE 44 – SOAK OUT AREA

(OLD MAP GRID F18)
IRP Site 44
Fact Sheet

1. **Contamination:** An unknown nonflammable solvent, believed to be Pennchem 901B, a polysulfide solvent containing mercaptan.

2. **Location:** Area approximately 75 feet east of Building 1363 and 40 feet south of Building 907.

3. **From:** Removal of propellant from rocket motor catapult tubes.

4. **When:** Late 1960s to early 1970s.

5. **Generated By:** Rocket motor catapult tubes were allowed to soak in the solvent contained in two 55-gallon drums that were welded together. The tubes soaked for 2 to 3 days and were then removed without regard to solvent spillage. However, a smaller catch tank was placed in the larger tank to collect pieces of propellant that fell out of the tubes. Reports indicated that the solvent drums (less than ten 55-gallon) were taken into the woods for storage until a disposal method was found. These drums could not be located.

6. **Amount:** Unknown.

7. **Work Completed:**

   a. A Site Inspection (SI) under the Navy Installation Restoration Program (IRP) was conducted as recommended in the Preliminary Assessment (PA) to determine if contamination is actually present. Soil and groundwater samples were collected and analyzed for volatile organic compounds (VOCs), base-neutral acids (BNAs), and total petroleum hydrocarbons (TPH).

   b. A Remedial Investigation (RI) Report for Site 44 was completed in July 1999. The report determined that the human health risk for all receptors is within acceptable levels. Ecological risks were not evaluated since it had previously been determined that the site did not offer any suitable habitat.

   c. A Proposed Plan was completed in February 2001. The plan presented a no further action (NFA) approach to the site.

   d. A public meeting was held on February 20, 2001 to present the Proposed Plan to the public.

   e. The Record of Decision (ROD), which recommends NFA, was signed in September 2002.

8. **Current Status:** The site was removed from the IR Program based on the signed NFA ROD.

SITE 45 – ABANDONED DRUMS

(OLD MAP GRID E18)
IRP Site 45
Fact Sheet

1. **Contamination:** Unknown.

2. **Location:** 250 feet west of Building 1363.

3. **From:** Unknown.

4. **When:** Circa 1980.

5. **Generated By:** Unknown. Possibly the same solvent that was used in the Soak Out Area.

6. **Amount:** Assuming the twenty-one 55-gallon drums and two over-pack drums were full, a total of 1,295 gallons of solvent would have leaked onto the ground.

7. **Work Completed:**

   a. A Site Inspection (SI) under the Navy Installation Restoration Program (IRP) was conducted as recommended in the Preliminary Assessment (PA) to determine if contamination is actually present. Three soil samples were taken from three soil borings with a hand auger. The borings were obtained at a depth not greater than three feet. These samples were analyzed for volatile organic compounds (VOCs), base-neutral acids (BNAs), and Target Analyte List (TAL) metals. In addition, four soil-gas samples were taken and analyzed for VOCs.

   b. Remedial investigation (RI) fieldwork was completed in 2001. Surface soil, subsurface soil, shallow groundwater, and sediment samples were collected and analyzed for Target Compound List (TCL) volatile organic compounds, TCL semivolatile organic compounds (SVOCs), TAL metals, and an expanded list of explosives.

   c. The Final RI Report was completed in April 2004, which recommended no further action (NFA) for this site.

8. **Current Status:** The Final Record of Decision (ROD), which recommended NFA, was signed in September 2005. In addition, the wetlands area downgradient of the site was addressed separately by a Site Screening Process (SSP) investigation that started in April 2004. A Decision Document, which recommended NFA, was signed in September 2006.

SITE 46 – CADMIUM SANDBLAST GRIT

(OLD MAP GRID E20)
IRP Site 46
Fact Sheet

1. **Contamination:** Cadmium.

2. **Location:** Gravel area behind Building 855.

3. **From:** Sandblast grit disposal.

4. **When:** Mid-1960s to possibly early 1980s.

5. **Generated By:** Rocket catapult tubes plated with cadmium were sandblasted at Building 855 as part of a resurfacing operation. Often, the cadmium-contaminated grit was dumped in the gravel area behind Building 855.

6. **Amount:** Estimates as to the amount, frequency, and time period over which the grit was disposed near the building could not be confirmed.

7. **Work Completed:**

   a. A Preliminary Assessment (PA) was performed and a Site Inspection (SI) was recommended under the Navy Installation Restoration Program (IRP) to determine if contamination is actually present.

   b. The SI was conducted under the Navy IRP. It included collecting nine soil samples using a hand auger and analyzing them for Target Analyte List (TAL) metals.

8. **Current Status:** A Site Screening Process (SSP) investigation started in April 2004. However, review of the data in the SI Report for this site led to the signing of a Decision Document in October 2004, which recommended no further action (NFA).

SITE 47 – MERCURIC NITRATE DISPOSAL AREA

(OLD MAP GRID F21)
IRP Site 47
Fact Sheet

1. **Contamination:** Mercuric nitrate, barium sludge, and solvents.

2. **Location:** South of the concrete pad behind Building 856.

3. **From:** Disposal of mercuric nitrate dissolved in nitric acid, disposal of barium sludge, and storage of solvents.

4. **When:** Mercuric nitrate disposal from 1957 through 1965, barium sludge disposal between 1969 and 1974.

5. **Generated By:** Mercuric nitrate is a catalyst that was used to produce hydrazinium nitroformate, an oxidizer used in the propellants for the Polaris missile. The spent solution, 1 ounce of mercuric nitrate dissolved in 98 percent nitric acid, was poured from 55-gallon drums onto a 6-foot by 4-foot bed of limestone chips. Additionally, a slurry of particulate barium sulfate used in the manufacturing process was pumped to a pit located approximately 50 feet to the east of Building 856.

6. **Amount:** Assuming enough limestone was present to neutralize the nitric acid, up to 274 pounds of mercuric nitrate (equivalent to 169 pounds of elemental mercury) would have precipitated out as a salt. An estimated 2,000 pounds of barium sulfate may have been disposed of in the barium pit.

7. **Work Completed:**

   a. A Preliminary Assessment (PA) was performed and a Site Inspection (SI) was recommended under the Navy Installation Restoration Program (IRP) to determine if contamination is actually present.

   b. An SI was conducted under the Navy IRP. It included collecting two soil samples with a hand auger in the ditch where the mercuric nitrate may have settled and analyzing for volatile organic compounds (VOCs), base-neutral organic acids (BNAs), and Target Analyte List (TAL) metals. In addition, 10 soil samples were collected with a hand auger at the south edge of the concrete pad. The samples were collected at various depths from 0 to 1 foot and were analyzed for VOCs, BNAs, and TAL metals. No limestone was found during the sampling.

   c. Remedial investigation (RI) fieldwork was conducted in several phases at Site 47. Groundwater, concrete chips, surface soil, and sediment samples were collected and analyzed for Target Compound List (TCL) volatile organic compounds, TCL semivolatile organic compounds (SVOCs), Target Analyte List (TAL) metals, and an expanded list of explosives during the initial field investigation in 1999. In 2001, membrane interface probe/electrical conductivity (MIP/EC) technology was used to further define the extent of VOC contamination, and six monitoring wells were installed and sampled for TCL VOCs. Further delineation of the VOC plume, as well as investigation of the reported barium sludge pit, was completed in 2002.

   d. The Final RI report was completed in December 2003.

e. A Baseline Ecological Risk Assessment (BERA) was conducted in 2004. Additional sampling in support of the BERA was completed in March 2006. The final BERA Report was submitted in September 2006.

f. A third-party optimization review of the pre-draft Feasibility Study (FS), which was completed in July 2005, recommended bench-scale tests and a pilot study to evaluate alternatives prior to finalizing the FS. The bench-scale tests were completed in May 2007, and the FS was completed in October 2008.

g. A Pilot Study Work Plan was submitted in May 2008. Field work consisting of monitoring well and gas vent installation was completed in May 2009. The first treatment injection began in October 2009, with a post-injection sampling event being completed in February 2010 and June 2010. Based on the February and June 2010 post-injection sample data, a second injection event for the pilot study was not needed.

h. A Proposed Plan was submitted in April 2012. The public meeting for the Proposed Plan was held on April 12, 2012. The Proposed Plan was finalized in April 2012.

i. The Record of Decision (ROD) was signed in February 2013. The selected remedy consists of in situ Chemical Oxidation in the source zone area, monitored natural attenuation in areas where the Site Remediation Goals (SRGs) are exceeded, and Institutional Controls (ICs) restricting residential development and use of shallow groundwater at the site until SRGs are met.

j. The final Remedial Design was submitted in February 2013

k. The final Remedial Action Work Plan was completed in March 2013

l. The Phase I fieldwork (well installation) for the remedial action was completed in June 2013. Phase II of the remedial action fieldwork was completed in November 2013. A LUC RD was completed in December 2013. The Final RACR was completed in May 2015.

8. Current Status: The site is currently in the RA-O phase.

SITE 48 – NITROGLYCERIN PLANT DISPOSAL AREA

(OLD MAP GRID H20)
IRP Site 48
Fact Sheet

1. **Contamination:** Unknown.

2. **Location:** On the hill behind Building 766.

3. **From:** Unknown, possibly laboratory samples.

4. **When:** Unknown.

5. **Generated By:** Unknown. Bottles, metal scrap, solvent containers, and refuse, possibly generated at Building 766, are visible on the hill. Most containers appear to be old and empty.

6. **Amount:** Unknown.

7. **Work Completed:**

   a. A Preliminary Assessment (PA) was performed and a Site Inspection (SI) was recommended under the Navy Installation Restoration Program (IRP) to determine if contamination is actually present.

   b. Two soil samples were taken on the hillside where the bottles and scrap are located in 1991. The samples were analyzed for mercury to determine if this site could be a source of mercury at the Building 766 ditch. No mercury was detected in the samples.

   c. A Site Investigation (SI) was conducted under the IRP. This SI included obtaining nine soil samples from three borings, three per boring at approximately 5-foot intervals. These samples were analyzed for volatile organic compounds (VOCs), base-neutral acids (BNAs), and total petroleum hydrocarbons (TPH).

8. **Current Status:** A Site Screening Process (SSP) investigation was started in April 2004. However, review of the data in the SI Report for this site led to the signing of a Decision Document in October 2004, which recommended no further action (NFA).

SITE 49 – CHEMICAL DISPOSAL PIT

(OLD MAP GRID L33)
IRP Site 49
Fact Sheet

1. **Contamination:** Waste chemicals, solvents, and mercury.

2. **Location:** Northeast of Building 444.

3. **From:** Lab operations.

4. **When:** Limited use up to the early 1970s.

5. **Generated By:** Bottles containing wastes were placed on a steel grate in the pit, and the drop plate was dropped. The plate then crushed the bottles containing waste chemicals. The glass fell into a wire basket, and the contents of the bottles were allowed to soak into the bottom of the pit.

6. **Amount:** Unknown.

7. **Work Completed:**

   a. A Preliminary Assessment (PA) was performed, and a Site Inspection was not recommended under the Navy Installation Restoration Program (IRP). According to Navy personnel, the pit received little, if any, use. No visible signs of disposal can be seen, such as chemical stains or broken glass.

   b. Five soil samples were taken at one soil boring and analyzed for volatile organic compounds (VOCs), base-neutral acids (BNAs), Target Analyte List (TAL) metals, and nitrate esters. One soil sample from inside the pit was obtained and was analyzed for VOCs, BNAs, TAL metals, and nitrate esters.

   c. This site is included in the "Lab Area" grouping of sites. Remedial Investigation (RI) field work was completed at the Lab Area in 2001. Surface and shallow subsurface soil, sediment, and surface water samples were collected in the Lab Area and analyzed for Target Compound List (TCL) volatile organic compounds, TCL semivolatile organic compounds (SVOCs), Target Analyte List (TAL) metals, and an expanded list of explosives.

   d. The RI Report for the Lab Area was completed in January 2004. A wetland delineation was completed in April 2006 and the Final Baseline Ecological Risk Assessment (BERA) Report was submitted in May 2006.

   e. During the RI, the chemical disposal pit (Site 49) was removed (excavated) and disposed offsite. Confirmatory samples were collected around and beneath the chemical disposal pit before the excavation was backfilled with clean imported fill.

   f. A Focused Feasibility Study (FS) for the Lab Area was completed in December 2009.

   g. A Proposed Plan for the Lab Area was completed in April 2010, recommending soil excavation, Institutional Controls (ICs), and wetland restoration. A public meeting was held on April 15, 2010.

   f. The Record of Decision (ROD) was signed in September 2011.

g. The Remedial Action Work Plan was finalized in November 2011 and remedial action activities for other portions of the Lab Area finished in May 2012. The Construction Completion Report was finalized in May 2013.

8. Current Status: ICs are in place at the Lab Area due to the unknown network of underground pipes that may contain mercury. The Remedial Action Completion Report (RACR) was finalized in July 2014.

SITE 50 – BUILDING 103 CRAWL SPACE

(OLD MAP GRID L34)
IRP Site 50
Fact Sheet

1. **Contamination:** Elemental mercury and possibly other chemicals.

2. **Location:** Crawl space of Building 103.

3. **From:** Sinks in Building 103.

4. **When:** From 1902 to 1985. During construction in 1985, it was discovered that the sinks did not drain to either the sanitary or storm sewer system. Instead, the sinks discharged directly to the soil under Building 103.

5. **Generated By:** Laboratory equipment containing mercury was used in Building 103 at various times. During sensitivity tests, nitrometer bulbs, which contained mercury, sometimes exploded under pressure. After testing, the spent mercury, which also contained sulfuric acid, was poured into a "slop jar." Tap water was run into the jar to remove the sulfuric acid from the mercury. Small spills from the transfer of mercury to the "slop jar" were common. Jars of mercury often broke during rinsing in the sink. Other chemicals were also placed in the sinks. A visual inspection of the crawl space revealed possible asbestos insulation covering the pipes. The insulation appeared to be in good condition.

6. **Amount:** Unknown.

7. **Work Completed:**

   a. The sinks were re-routed to the sanitary sewer system. In addition, chemicals are no longer put down the sink.

   b. A Site Inspection under the Navy Installation Restoration Program (IRP) was conducted as recommended in the Preliminary Assessment to determine if contamination is actually present. This inspection included taking soil-boring samples from the crawl space under Building 103 and analyzing for volatile organic compounds (VOCs), base-neutral acids (BNAs), Target Analyte List (TAL) metals, and nitrate esters.

   c. This site is included in the "Lab Area" grouping of sites. Remedial Investigation (RI) field work was completed at the Lab Area in 2001. Surface and shallow subsurface soil, sediment, and surface water samples were collected in the Lab Area and analyzed for Target Compound List (TCL) volatile organic compounds, TCL semivolatile organic compounds (SVOCs), Target Analyte List (TAL) metals, and an expanded list of explosives.

   d. The RI Report for the Lab Area was completed in January 2004. A wetland delineation was completed in April 2006 and the Final Baseline Ecological Risk Assessment (BERA) Report was submitted in May 2006.

   e. A Focused Feasibility Study (FS) was completed in December 2009.

   f. A Proposed Plan was completed in April 2010, recommending soil excavation, Institutional Controls (ICs), and wetland restoration. A public meeting was held on April 15, 2010.

f. The Final Record of Decision (ROD) was signed in September 2011.

g. The Remedial Action Work Plan was finalized in November 2011 and remedial action activities finished in May 2012. The Construction Completion Report was finalized in May 2013.

8. Current Status: ICs are in place due to the unknown network of underground pipes that may contain mercury. The Remedial Action Completion Report (RACR) was finalized in July 2014.

SITE 51 – BUILDING 101 DRY WELL

(OLD MAP GRID L34)
IRP Site 51
Fact Sheet

1. **Contamination:** None.

2. **Location:** Dry well by Building 101.

3. **From:** N/A.

4. **When:** N/A.

5. **Generated By:** Initially, it was believed that a laboratory waste stream was separated for disposal purposes. The volatile component was evaporated in a flash tank while the remaining liquid wastes were discharged into a dry well. However, inspection of Department of the Navy, Bureau of Yards and Docks drawings revealed that the flash tank did not discharge to the dry well.

6. **Amount:** None.

7. **Work Completed:**

   a. A Preliminary Assessment (PA) was performed, and a Site Inspection (SI) was not recommended under the Navy Installation Restoration Program (IRP).

   b. This site was subjected to a Site Screening Process (SSP) during 2002. The field investigation included a geophysical survey and the collection of subsurface soil samples for analysis of Target Compound List (TCL) volatile organic compounds (VOCs).

   c. The SSP Report was completed in March 2003. The report recommended no action.

8. **Current Status:** A No Action Decision Document was signed by the Navy and EPA with concurrence from the MDE in June 2003.

SITE 52 – BUILDING 102 DRY WELL

(OLD MAP GRID L34)
IRP Site 52
Fact Sheet

1. **Contamination:** None.

2. **Location:** Dry well by Building 102.

3. **From:** N/A.

4. **When:** N/A.

5. **Generated By:** Initially, it was believed that a laboratory waste stream was separated for disposal purposes. The volatile component was evaporated in a flash tank while the remaining liquid wastes were discharged into a dry well. However, inspection of Department of the Navy, Bureau of Yards and Docks drawings revealed that the flash tank did not discharge to the dry well.

6. **Amount:** None.

7. **Work Completed:**

   a. A Preliminary Assessment was performed, and a Site Inspection was not recommended under the Navy Installation Restoration Program (IRP).

   b. This site was subjected to a Site Screening Process (SSP) during 2002. A visual of the physical conditions at the site as well as available drawings of the site did not indicate the presence of a dry well in the area separate from the Site 51 dry well (which is located nearby). No further investigation of the Site 51 was conducted.

   c. The Site Screening Process (SSP) Report was completed in March 2003. The report recommended no action.

8. **Current Status:** A No Action Decision Document was signed by the Navy and EPA with concurrence from the MDE in June 2003.

SITE 53 – MERCURY CONTAMINATION OF THE SEWAGE SYSTEM

(OLD MAP GRID L34)
IRP Site 53
Fact Sheet

1. **Contamination:** Mercury.

2. **Location:** Storm and sanitary sewer pipes.

3. **From:** Building 102.

4. **When:** 1909 through 1986.

5. **Generated By:** In 1969, approximately 10 pounds of mercury were discovered in a storm sewer manhole and, in 1989, approximately 1 pound of mercury was discovered in a sanitary sewer manhole. Both manholes have drain line connections to Building 102. Laboratory equipment that contained mercury, such as nitrometers, was used extensively in Building 102. Mercury often entered drains during the cleaning of laboratory equipment. In 1986, when mercury traps were placed on all sinks in Building 102, mercury was discovered in the U-joints of the sinks.

6. **Amount:** The Draft Preliminary Assessment Report states that only about 10 percent of the mercury sent to Building 102 was returned to the Building 444 storage vault for reclamation. Laboratory workers estimated that approximately 1 liter of mercury was lost per month. Therefore, it is possible that 28,000 pounds of mercury could have been discharged to the drain lines over the 77-year period that the building operated without mercury traps on the sinks.

7. **Work Completed:**

   a. Ten pounds of mercury discharged in the storm sewer manhole in 1969 were recovered.

   b. One pound of mercury discharged in the sanitary sewer manhole in 1989 was recovered.

   c. A television inspection of the gravity sewer lines was conducted in late 1988. The vitrified clay and terra cotta pipes were broken, cracked, sagging, separated, and, in some cases, collapsed. Mercury contamination of the sewage sludge rose to 150 parts per million while the television inspection was being conducted. This suggests that the sewer cleaning, which was done prior to the television inspection, washed mercury down to the Sewage Treatment Plant. Mercury levels have since dropped to levels acceptable for sending the sludge to an approved landfill.

   d. A Site Inspection (SI) was conducted under the Navy Installation Restoration Program (IRP) and included:

      1) Taking 26 soil samples from 13 borings. One sample per boring was located below the level of the sewer line. These samples were analyzed for mercury and nitrate esters. In addition, some samples were analyzed for volatile organic compounds (VOCs), base-neutral acids (BNAs), Target Analyte List (TAL) metals, and total petroleum hydrocarbon (TPH).

      2) Obtaining four sediment samples from sanitary and storm sewer manholes and analyzing for mercury and nitrate esters.

e. During the SI, six monitoring wells were to be installed. However, at a depth of approximately 41 feet, a marker bed was encountered that was subsequently identified as a unit of the Tertiary Brandywine Formation that is on top of the Patapsco Formation. The Upper Patapsco Formation is a confining unit, which is estimated to be 100 feet thick. Therefore, no shallow water-bearing zones were present.

f. This site is included in the "Lab Area" grouping of sites. Remedial Investigation (RI) field work was completed at the Lab area in 2001. Surface and shallow subsurface soil, sediment and surface water samples were collected in the Lab Area and analyzed for Target Compound List (TCL) VOCs, TCL semivolatile organic compounds (SVOCs), TAL metals, and an expanded list of explosives.

g. The RI Report for the Lab Area was completed in January 2004. A wetland delineation was completed in April 2006 and the Final Baseline Ecological Risk Assessment (BERA) Report was submitted in May 2006.

h. A Focused Feasibility Study (FS) was completed in December 2009.

i. A Proposed Plan was completed in April 2010, recommending soil excavation, Institutional Controls, and wetland restoration. A public meeting was held on April 15, 2010.

f. The Final Record of Decision (ROD) was signed in September 2011.

g. The Remedial Action Work Plan was finalized in November 2011 and remedial action activities finished in May 2012. The Final Construction Completion Report was submitted in May 2013.

8. Current Status: ICs are in place due to the unknown network of underground pipes that may contain mercury. The Remedial Action Completion Report (RACR) was finalized in July 2014.

SITE 54 – BUILDING 101

(OLD MAP GRID L34)
IRP Site 54
Fact Sheet

1. **Contamination:** Mercury and asbestos.

2. **Location:** Basement of Building 101.

3. **From:** Use of laboratory equipment that contained mercury and possibly leaking pipes.

4. **When:** From building construction in 1909 to mid-1980s.

5. **Generated By:** In January 1990, several droplets of mercury were discovered on the insulation of a steam pipe located in the southeastern corner room of the basement in Building 101. In addition, in the mid-1980s, an employee noticed solvent odors in the basement when solvent was flushed down the sink in the room above, indicating a leaky pipe.

   Laboratory equipment that contained mercury was used in the room above the basement where mercury was discovered. A 1918 blueprint shows four nitrometers located in this room. During sensitivity tests, nitrometer bulbs, which contained mercury, sometimes exploded under pressure. After testing, the spent mercury, which also contained sulfuric acid, was poured into a "slop jar." Tap water was run into the jar to remove the sulfuric acid from the mercury. Small spills were common from transferring mercury to the "slop jar." Jars of mercury often broke during rinsing in the sink.

6. **Amount:** Unknown.

7. **Work Completed:**

   a. A Site Inspection was conducted under the Navy Installation Restoration Program (IRP), as recommended in the Preliminary Assessment, to determine the extent of contamination. This inspection included:

      1) Taking five wipe samples within the building and analyzing for mercury.

      2) Taking five media samples from within the building and analyzing for mercury.

      3) Obtaining five soil boring samples from beneath the building and analyzing for mercury and nitrate esters.

   b. This site is included in the "Lab Area" grouping of sites. Remedial Investigation (RI) field work was completed at the Lab Area in 2001. Surface and shallow subsurface soil, sediment, and surface water samples were collected in the Lab Area and analyzed for Target Compound List (TCL) volatile organic compounds, TCL semivolatile organic compounds (SVOCs), Target Analyte List (TAL) metals, and an expanded list of explosives.

   c. The RI Report for the Lab Area was completed in January 2004. A wetland delineation was completed in April 2006 and the Final Baseline Ecological Risk Assessment (BERA) Report was submitted in May 2006.

   d. A Focused Feasibility Study (FS) was completed in December 2009.

e. A Proposed Plan was completed in April 2010 recommending soil excavation, Institutional Controls (ICs), and wetland restoration. A public meeting was held on April 15, 2010.

f. The Final Record of Decision (ROD) was signed in September 2011.

g. The Remedial Action Work Plan was completed in November 2011 and remedial action activities finished in May 2012. All CERCLA-related work was limited to discharges from Building 101 and not the contamination inside of the building. The Construction Completion Report for the Lab Area was finalized in May 2013.

8. Current Status: Institutional Controls remain onsite due to the unknown network of underground pipes that may contain mercury. The Remedial Action Completion Report (RACR) was finalized in July 2014.

SITE 55 – BUILDING 102

(OLD MAP GRID L34)
IRP Site 55
Fact Sheet

1. Contamination: Mercury and asbestos.

2. Location: Building 102.

3. From: Use of laboratory equipment that contained mercury.

4. When: From building construction in 1909 to 1963 when renovations to the building were made.

5. Generated By: On October 6, 1987, metallic mercury was discovered dripping from the ceiling onto the sink table top of the coffee mess, located in the northern end of the basement of Building 102. Review of Department of the Navy, Bureau of Yards and Docks drawings indicates that a nitrometer was once located in the room directly above the area were the metallic mercury was discovered.

While installing mercury traps in the sinks of Building 102 in 1986, the plumber reported approximately a teaspoon of mercury in each of the U-joints.

During sensitivity tests, nitrometer bulbs, which contained mercury, sometimes exploded under pressure. After testing, the spent mercury, which also contained sulfuric acid, was poured into a "slop jar." Tap water was run into the jar to remove the sulfuric acid from the mercury. Small spills from transferring mercury to the "slop jar" were common. Jars of mercury often broke during rinsing in the sink.

6. Amount: Unknown.

7. Work Completed:

a. During building renovations in 1963, the nitrometer operation was moved to the southern room on the first floor of Building 102, and the floor was sealed with a 2-inch layer of concrete.

b. In the mid-1970s, the nitrometer was moved to the southern room in the basement of Building 102 and, in the early 1980s, the floor drains were sealed to prevent mercury release in case of a spill.

c. Cleanup of the mercury began after the mercury was found dripping from the ceiling but promptly ceased after asbestos was discovered.

d. Plastic sheeting was placed under the ceiling to encapsulate the leaking mercury, and the northern end of the building was closed to protect the health of the employees.

e. In February 1989, the building was abandoned. In June 1991, the water supply to the building was disconnected to eliminate the potential for mercury contamination of the sludge generated from sewage treatment.

f. A Site Inspection was conducted under the Navy Installation Restoration Program (IRP). This inspection included:

1) Taking five wipe samples within the building and analyzing for mercury.

2) Taking five media samples from within the building and analyzing for mercury.

3) Obtaining five soil boring samples from beneath the building and analyzing for mercury and nitrate esters.

g. This site is included in the "Lab Area" grouping of sites. Remedial Investigation (RI) field work was completed at the Lab Area in 2001. Surface and shallow subsurface soil, sediment, and surface water samples were collected in the Lab Area and analyzed for Target Compound List (TCL) volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), Target Analyte List (TAL) metals, and an expanded list of explosives.

h. The RI Report for the Lab Area was completed in January 2004. A wetland delineation was completed in April 2006 and the Final Baseline Ecological Risk Assessment (BERA) Report was submitted in May 2006.

i. A Focused Feasibility Study (FS) was completed in December 2009.

j. A Proposed Plan was completed in April 2010 recommending soil excavation, Institutional Controls (ICs), and wetland restoration. A public meeting was held on April 15, 2010.

f. The Record of Decision (ROD) was signed in September 2011.

g. The Remedial Action Work Plan was finalized in November 2011 and remedial action activities finished in May 2012. All CERCLA-related work was limited to discharges from Building 101 and not the contamination inside of the building. The Construction Completion Report for the Lab Area was finalized in May 2013.

8. Current Status: ICs are in place due to the unknown network of underground pipes that may contain mercury. The Remedial Action Completion Report (RACR) was finalized in July 2014.

SITE 56 – LEAD CONTAMINATION AT INDUSTRIAL WASTEWATER OUTFALL (IW) 87

(OLD MAP GRID H19)
IRP Site 56
Fact Sheet

1. **Contamination:** Lead.

2. **Location:** Pit, pipe, and sediment leading to IW87 from Building 790.

3. **From:** Washdown of lead-lined floor.

4. **When:** 1953 to October 1992.

5. **Generated By:** Building 790 contains a tank of nitric acid and a tank of sulfuric acid. The fumes from these acids get on the walls and floor inside the building, requiring a periodic wash-down of the walls and floor. The fumes from the strong acids dissolved the lead from the flooring, and the wash-down provided a route for the dissolved lead to discharge from the building to IW87.

6. **Amount:** Unknown.

7. **Work Completed:** An Engineering Evaluation/Cost Analysis (EE/CA) was prepared to determine the best method for cleaning this lead from the pit, pipe, and sediment.

   A removal action conducted in late 1996 included removal and cleaning of the pipe leading to IW87, excavation of the outfall area, treatment of contaminated water on the site, and relining of the pipe.

8. **Current Status:** A Site Screening Process (SSP) investigation for this site started in April 2004. A Decision Document, which recommended no further action (NFA), was signed in September 2006.

SITE 57 – BUILDING 292 TCE CONTAMINATION

(OLD MAP GRID P33)
IRP Site 57
Fact Sheet

1. **Contamination:** Trichloroethylene (TCE).

2. **Location:** Building 292.

3. **From:** Possible discharges and spills from drainage of the vapor-degreasing tank.

4. **When:** 1964 to 1989.

5. **Generated By:** Emptying of a 2000-gallon vapor-degreasing tank. The cleaning system used TCE vapors to clean metal parts. The 2000-gallon tank of TCE was emptied and refilled approximately every 6 months.

6. **Amount:** Unknown. Extent of contamination to be determined.

7. **Work Completed:**

   a. A limited subsurface investigation was conducted in March 1996. This investigation indicated elevated levels of TCE in the soil and groundwater in the area south of Building 292.

   b. A draft Engineering Evaluation/Cost Analysis (EE/CA) was completed in October 1996. Before the EE/CA was completed, a treatability study was conducted to determine if Soil Vapor Extraction (SVE) was an effective remedy. The results of the treatability study indicated that SVE would not work at the site due to the geology and location of the groundwater table.

   c. In 1998, the Navy completed an interim removal action (IRA) at Site 57 to address infiltration of TCE-contaminated groundwater into a storm sewer leading to outfall IW-80. Approximately 700 feet of storm sewer were lined to inhibit the accelerated migration of TCE.

   d. The Navy completed a remedial investigation at Site 57 in July 2000.

   e. During August 2001, a field investigation was conducted at Site 57 to collect data to aid in the evaluation of remedial alternatives during the preparation of an FS.

   f. A pilot study, which includes injecting Hydrogen Release Compound (HRC) in shallow groundwater to facilitate in situ bioremediation, began in May 2003.

   g. An EE/CA for contaminated soil was completed in August 2005.

   h. The final Feasibility Study (FS) was submitted in July 2006. A third party optimization review of the FS was completed in April 2006.

   i. An interim removal action for soil was completed in July 2006.

   j. The final Record of Decision was signed in September 2007.

   k. The 65% Remedial Design and draft Long-Term Monitoring (LTM) Plan were submitted in October and November 2007. An optimization review was completed and recommended

additional investigation to better delineate the contaminant source area. The final Design Investigation Work Plan and investigation field work was completed in February and April 2009 respectively. The final RD was submitted in December 2009 and the final LTM Plan was submitted in March 2010.

l. The Final Remedial Action Work Plan was submitted in October 2010. Complications using the preferred Remedial Alternative of emulsified vegetable oil via permanent injection wells arose during implementation, which led to a decision of altering the remedial technology. The new remedial technology to be used at the site is A-SOX and Proton Reduction Technology (PRT).

m. The PRT Work Plan was finalized in October 2012, along with the installation of the A-SOX system.

n. The PRT demonstration work plan was completed in January 2013 and the Final PRT Evaluation Report to assess impacts to nearby buildings was submitted in March 2013.

8. Current Status: PRT demonstration fieldwork was completed in July 2013. A Final full-scale PRT design was completed in November 2013. Fieldwork and installation of the PRT system was completed in May 2015. The site is currently in the RA-O phase.

SITE 66 – TURKEY RUN DISPOSAL AREA

(OLD MAP GRID H8, I8, J8)
IRP Site 66
Fact Sheet

1. **Contamination:** Unknown.

2. **Location:** Woods and streambed behind Building 1440.

3. **From:** Disposal of various items, including lead flooring, clinker from Powerhouse, glass bottles, etc., based on visual inspection of the area.

4. **When:** Exact dates unknown.

5. **Generated By:** Disposal of various items.

6. **Amount:** Unknown.

7. **Work Completed:**

   a. Site was visually inspected and included in the Installation Restoration Program (IRP) in 2004.

   b. The final Work Plan for the Site Screening Assessment investigation was completed in July 2007. Field work which included sampling was conducted at the site in April 2007. Based on the results of the field work, the IHIRT decided to change the investigation from a Site Screening Process to a Site Inspection (SI).

   c. A final SI Report was completed in November 2008 and recommended that a Remedial Investigation (RI) be performed..

   d. The Final RI Report was submitted in February 2012. It recommended that an additional investigation, a Baseline Ecological Risk Assessment (BERA), and a Wetland Delineation be completed to fill data gaps prior to the start of the Feasibility Study.

8. **Current Status:** A UFP-SAP Work Plan for the Pre-FS additional investigation and BERA was finalized in July 2014 and fieldwork is expected to be completed in the fall of 2015.

SITE 67 – HOG-OUT FACILITY

IRP Site 67
Fact Sheet

1. Contamination: Perchlorate.

2. Location: Building 1419.

3. From: Cleaning out solid propellant containing ammonium perchlorate from various devices.

4. When: 1960s to mid-1990s.

5. Generated By: Cleanout or "hog-out" of various devices, including rockets and ejection seat motors that have exceeded their useful life span.

6. Amount: Unknown.

7. Work Completed:

a. A field demonstration of in situ bioremediation of perchlorate was conducted in 2002.

b. Additional sampling of the area was completed as part of additional pilot study and demonstration efforts in 2005, and perchlorate was identified in shallow groundwater.

c. Site was added to the Navy Installation Restoration Program (IRP) in 2006.

d. A desktop audit technical memorandum was finalized in March 2011. The document summarized previous data and investigative efforts at the site and recommended an Remedial Investigation (RI).

e. The Final RI UFP-SAP Work Plan was submitted in July 2013. The phase I RI fieldwork was completed in August 2013.

8. Current Status: Due to the discovery of additional contamination, another phase of RI investigation fieldwork is planned for the fall of 2015. Submittal of the RI Report has been delayed.

SITE 69 – BUILDING 1018

IRP Site 69
Fact Sheet

1. **Contamination:** Perchlorate.

2. **Location:** Building 1018 – Oxidizer Process Building.

3. **From:** Unloading/transferring ammonium perchlorate at Building 1018 for processing.

4. **When:** 1960s to 2000s.

5. **Generated By:** Spillage during unloading/transferring activities at Building 1018 for perchlorate processing.

6. **Amount:** Unknown.

7. **Work Completed:**

   a. Pre-demolition sampling identified elevated perchlorate in soil surrounding Building 1018 in January 2011.

   b. Site was added to the Navy Installation Restoration Program (IRP) in 2011.

   c. The Final Site Screening Process (SSP) UFP-SAP Work Plan was submitted in July 2013. The SSP fieldwork was completed at Site 69 along with AOC 31 in July 2013.

8. **Current Status:** A UFP-SAP RI Work Plan is planned to be submitted in September 2015 with fieldwork in late 2015.

SITE 70 – GROUNDWATER CONTAMINATION ALONG WATER WORKS WAY

IRP Site 70
Fact Sheet

1. **Contamination:** TCE, lead, and arsenic in groundwater

2. **Location:** North/West (upgradient) of and within Scrap Yard (IRP Site 41 / MRP Site UXO 32), near Building 1470.

3. **From:** Scrap and discarded materials disposal and staging in the Scrap Yard, and unknown (to be determined) upgradient source(s). The site was discovered (i.e., assigned) as a result of attempting to find the source of groundwater contamination located at the Scrap Yard during the Remedial Investigation (RI) / Feasibility (FS) and Interim Removal Action (IRA) at Site 41 / UXO 32.

4. **When:** From the 1960s to 1988.

5. **Generated By:** Release(s) from historical storage of coal and lead-acid batteries (along with various scrap materials) and unknown upgradient release(s).

6. **Amount:** Unknown.

7. **Work Completed:** Sampling conducted while determining the extent of groundwater contamination during Site 41/UXO 32 RIs determined some groundwater contamination originates upgradient of the Scrap Yard.

8. **Current Status:** The groundwater medium at the Scrap Yard was assigned as new IRP Site 70 in 2013. Scoping for the groundwater RI began in 2013. A UFP-SAP Work Plan addendum was finalized in May 2015. RI fieldwork is anticipated to begin in the fall of 2015.

SWMUs 4 AND 5 – UNDERGROUND STORAGE TANKS AT TRANSPORTATION DEPARTMENT

(OLD MAP GRID E37)
IRP AOC
Main Area SWMUs 4 and 5
Fact Sheet

1. **Contamination:** Waste oil from equipment maintenance.

2. **Location:** These units consist of one 550-gallon underground storage tank (UST) (SWMU 4) behind the automotive shop (Building 290) and a second 1,000-gallon UST (SWMU 5) behind the heavy equipment shop (Building 525).

3. **From:** Waste oil from equipment maintenance is placed in a basin, which is approximately 36 inches by 18 inches by 12 inches deep, inside the shops. The waste oil drains through a pipe to the USTs. A contractor pumps the waste oil from the tanks to a truck for off-site disposal.

4. **When:** Facility personnel indicated that the units have been in operation since 1978.

5. **Generated By:** The wastes managed at this unit include waste oils from the transportation equipment maintenance branch.

6. **Amount:** One 550-gallon underground storage tank (SWMU 4) and a second 1,000-gallon UST (SWMU 5).

7. **Work Completed:**

   a. During the visual site inspection (VSI), stained soil was observed in the vicinity of the standpipe from the UST behind Building 525 (SWMU 5). No evidence of release was observed in the vicinity of SWMU 4.

   b. These units were included in the January 2002 Desktop Audit Decision Document, which was signed by the Navy and EPA with concurrence from the MDE on April 23, 2002.

8. **Current Status:** The decision reached during the desktop audit was that no action is required to be taken in connection with these units.

SWMU 6 – USED BATTERY ACCUMULATION AREA (BUILDING 290)

(OLD MAP GRID R27)
IRP AOC
Main Area SWMU 6
Fact Sheet

1. **Contamination:** Unit is used for storage of used batteries.

2. **Location:** Automotive shop (Building 290).

3. **From:** The Transportation Department automotive shop (Bldg. 290) uses an area outside the building for accumulation of used batteries. The batteries are stored on wooden pallets over a concrete driveway. The area is uncovered and measures approximately 6 feet wide by 10 feet long.

4. **When:** According to facility representatives, the date the area was first used for storage is not known. However, the area has been used for several years.

5. **Generated By:** The Transportation Department automotive shop (Building 290) uses an area outside the building for accumulation of used batteries.

6. **Amount:** Unknown

7. **Work Completed:**

   a. Staining was observed on the concrete pad during the visual site inspection (VSI). However, no visible signs of release to soils were noted, and no releases were noted in available file information.

   b. This unit was included in the January 2002 Desktop Audit Decision Document, which was signed by the Navy and EPA with concurrence from the MDE on April 23, 2002.

8. **Current Status:** The decision reached during the desktop audit was that no action is required to be taken in connection with this unit.

SWMU 27 – WASTE OIL STORAGE AREA (GOODARD POWER PLANT)

(OLD MAP GRID N31)
IRP AOC
Main Area SWMU 27
Fact Sheet

1. **Contamination:** The area is approximately 150 feet long by 50 feet wide and includes metal drums of waste oil sitting on the soil surface. At the time of the visual site inspection (VSI), the unit contained eight drums of waste oil from the oil/water separator, five empty drums labeled pelletized nitrocellulose, and a pile of oily soil that was approximately 12 feet by 10 feet by 3 feet high. The pile appeared to contain waste oil and absorbent collected from spills inside the power plant.

   Remediation activities included the removal of the empty drums and the partial removal of the empty waste oil and absorbent. The remaining stained soil was drummed for off-site disposal.

2. **Location:** Fuel storage area at Goddard Power Plant.

3. **From:** Goddard Power Plant.

4. **When:** Area had been used for storage of this type since the start-up of the power plant in 1957.

5. **Generated By:** This unit is used for storage of waste oil collected from the power plant. The drums of waste oil are taken to the Caffee Road thermal treatment unit (SWMU 21) for burning or to Building 455 (SWMU 2) for off-site disposal.

6. **Amount:** At the time of the visual site inspection (VSI), the unit contained eight drums of waste oil from the oil/water separator, five empty drums labeled pelletized nitrocellulose, and a pile of oily soil approximately 12 feet by 10 feet by 3 feet high.

7. **Work Completed:**

   a. On the second day of the VSI, a pile of stained soil was observed in the area. During the fifth day of the VSI, the unit was revisited, and it was observed that the waste pile had been partially removed and that an area of stained soil remained.

   b. This unit was included in the January 2002 Desktop Audit Decision Document, which was signed by the Navy and EPA with concurrence from the MDE on April 23, 2002.

8. **Current Status:** The decision reached during the desktop audit was that no action is required to be taken in connection with this unit.

SWMU 38 – CAFFEE ROAD WASTE OIL STORAGE AREA

(OLD MAP GRID L6)
IRP AOC
Main Area SWMU 38
Fact Sheet

1. **Contamination:** This unit is a storage area for drums of waste oil used at the Decontamination Burn Point (SWMU 21).

2. **Location:** Decontamination Burn Point (SWMU 21).

3. **From:** The oil is used to start and maintain the fire at the burn point. The fire is initiated to flash explosive residue from discarded metal parts generated on-base.

4. **When:** Oil has been stored at this location since approximately 1986.

5. **Generated By:** The unit is used for storage of waste oil from vehicles and machinery in drums. The oil is used to start and maintain the fire at the Decontamination Burn Point.

6. **Amount:** Unknown.

7. **Work Completed:**

   a. There was no known history of release at the unit, and no signs of release were observed during the visual site inspection.

   b. This unit was included in the January 2002 Desktop Audit Decision Document, which was signed by the Navy and EPA with concurrence from the MDE on April 23, 2002.

8. **Current Status:** The decision reached during the desktop audit was that this unit would be handled with Site 11. The remedial action at Site 11 also addresses this SWMU. See the fact sheet for Main Area IRP Site 11.

SWMUs 40-46 – WASTEWATER COLLECTION TREATMENT TANKS (MOSER PLANT)

(OLD MAP GRID E17)
IRP AOC
Main Area SWMUs 40 through 46
Fact Sheet

1. **Contamination:** These seven units are used for the collection and treatment of wastewater generated from the production of nitrate esters (e.g., nitroglycerin, nitrocellulose, etc.) at the Moser Plant. The wastewater contains concentrations of slightly acidic explosive residue.

2. **Location:** Moser Plant.

3. **From:** The tanks are used to collect the wastewater, settle the explosive residue, and neutralize the acidity, if necessary.

4. **When:** The units were installed and began operation in the mid-1970s.

5. **Generated By:** The units are used for collection and treatment of wastewater containing explosive residue, which is slightly acidic. The settled explosive residue from the wastewaters is adsorbed onto wood chips and burned at the Cast Plant Burn Point (SWMU 19). The water is discharged to an NPDES outfall after settling.

6. **Amount:** Unknown.

7. **Work Completed:**

   a. The tanks observed during the visual site inspection included two 300-gallon tanks, one 1,000-gallon tank, and one 200-gallon tank. The tanks were all constructed of steel, were located indoors on concrete floors, and were each covered. Three additional tanks of the same design and construction are located in the process area.

   b. These units were included in the January 2002 Desktop Audit Decision Document, which was signed by the Navy and EPA with concurrence from the MDE on April 23, 2002.

8. **Current Status:** The decision reached during the desktop audit was that no action is required to be taken in connection with these units.

SWMUs 47-51 – SPENT ACID STORAGE TREATMENT TANKS (MOSER PLANT)

(OLD MAP GRID E17)
IRP AOC
Main Area SWMUs 47 through 51
Fact Sheet

1. **Contamination:** These five units are used for the collection and treatment of spent acid generated during production of nitrated esters at the Moser Plant.

2. **Location:** Moser Plant.

3. **From:** The tanks include three spent acid tanks, including one 150-gallon and two 553-gallon tanks, one 200-gallon slum recovery tank, and one 6,000-gallon neutralization tank (divided into two compartments). The tanks are constructed of steel, are located indoors, and are covered. The level in the tanks is controlled by batch flow to the units.

4. **When:** Tanks were installed and began operation in the mid-1970s.

5. **Generated By:** The units are used for collection and treatment of spent acid from the production of nitrated esters. The wastewater from neutralization is discharged to an NPDES outfall. The facility representative stated that no sludge was generated by the neutralization process.

6. **Amount:** Unknown.

7. **Work Completed:**

   a. There is no history of release from the units, and there were no visible signs of release during the visual site inspection.

   b. These units were included in the January 2002 Desktop Audit Decision Document, which was signed by the Navy and EPA with concurrence from the MDE on April 23, 2002.

8. **Current Status:** The decision reached during the desktop audit was that no action is required to be taken in connection with these units.

SWMUs 64-66 – WASTEWATER STORAGE TANKS (BUILDING 1596)

(OLD MAP GRID P30)
IRP AOC
Main Area SWMUs 64 through 66
Fact Sheet

1. **Contamination:** The units were used for storage of water contaminated with hydrazine fuel.

2. **Location:** Building 1596.

3. **From:** The wastewater storage tanks located in Building 1596 were used for storage of water contaminated with hydrazine fuel. The water was incinerated in Thermal Destructor 2 (SWMU 63). The tanks are located indoors over concrete flooring. They are constructed of polyurethane and are approximately 10,000-gallon each in capacity.

4. **When:** The exact date of installation of the tanks is not certain; however, it is assumed the tanks were installed circa 1976 [i.e. the same time as construction of Thermal Destructor 2 (SWMU 63)].

5. **Generated By:** The tanks are located indoors on a concrete floor and have been empty for a number of years. No details were available on the control of flow to the tanks.

6. **Amount:** Unknown.

7. **Work Completed:**

   a. There is no known history of release from the units, and no visible signs of release were observed during the visual site inspection.

   b. These units were included in the January 2002 Desktop Audit Decision Document, which was signed by the Navy and EPA with concurrence from the MDE on April 23, 2002.

8. **Current Status:** The decision reached during the desktop audit was that no action is required to be taken in connection with these units.

SWMU 69 – TEMPORARY ACCUMULATION DUMPSTERS FOR EXPLOSIVE SCRAP

IRP AOC
Main Area SWMU 69
Fact Sheet

1. **Contamination:** The dumpsters are used for storage of explosive scrap from processes throughout the facility.

2. **Location:** Throughout the base.

3. **From:** NSFIH uses metal dumpsters for collection of explosive scrap from manufacturing and associated operations throughout the base.

4. **When:** The practice of storing explosive scrap in dumpsters was used at the base from the late 1950s until 1992.

5. **Generated By:** The dumpsters are color coded (blue or yellow) for use only as storage for explosive scrap. They are constructed of metal, measure approximately 5 feet long by 4 feet wide by 4 feet deep, and are typically located over concrete or asphalt. The explosive scrap contained in a water bath is in the dumpster. Water must be present in the dumpsters for safety reasons: dry propellant scrap is an explosive hazard. When filled, the dumpster is transported to the burn point (SWMU 19), the water is filtered and discharged through an NPDES outfall, and the explosive scrap is burned at the burn point.

   The dumpsters are filled to fill-lines marked on the dumpster. The fill-line leaves ample freeboard to prevent overflow or spilling from the dumpster.

6. **Amount:** 50 to 60 dumpsters

7. **Work Completed:**

   a. There is no known history of release from the dumpsters. Visual inspection of several units during the visual site inspection found no signs of release. All inspected units were found to be in good condition.

   b. This unit was included in the January 2002 Desktop Audit Decision Document, which was signed by the Navy and EPA with concurrence from the MDE on April 23, 2002.

8. **Current Status:** The decision reached during the desktop audit was that no action is required to be taken in connection with this unit.

SWMU 70 – TEMPORARY ACCUMULATION BUILDINGS FOR DRUMMED EXPLOSIVE SCRAP

IRP AOC
Main Area SWMU 70
Fact Sheet

1. **Contamination:** The buildings are used for temporary storage of explosive scrap generated at process areas throughout the facility.

2. **Location:** The storage locations are wooden sheds, all of similar design, constructed over concrete pads. The sheds are covered and typically measure approximately 6 feet by 6 feet.

3. **From:** NSFIH has 51 storage buildings for accumulation of explosive scrap in metal cans. The metal cans (commonly called G.I. cans) are about 30 gallons in size and are color coded blue or yellow for use only as storage for explosive scrap.

4. **When:** There are 51 temporary accumulation areas that have been constructed at various times during the facility operation.

5. **Generated By:** Explosive scrap is typically adsorbed (i.e., liquid) onto wood chips and collected in non-conductive rubber bags, placed in the metal cans, and stored in the accumulation area. Cans were removed daily to the burn point (SWMU 19) for safety reasons.

   The explosive scrap is collected in non-conductive rubber bags, placed in the metal cans, and stored in the building. The buildings have concrete floors but no curbs.

6. **Amount:** Unknown.

7. **Work Completed:**

   a. There is no known history of release from the units, and the visual inspection found no signs of release.

   b. This unit was included in the January 2002 Desktop Audit Decision Document, which was signed by the Navy and EPA with concurrence from the MDE on April 23, 2002.

8. **Current Status:** The decision reached during the desktop audit was that no action is required to be taken in connection with this unit.

SWMU 72 – OIL/WATER SEPARATORS

IRP AOC
Main Area SWMU 72
Fact Sheet

1. **Contamination:** Several wastewater discharge lines at NSFIH include an oil/water separator for removal of floating oil from the wastewater prior to discharge through an NPDES outfall.

2. **Location:** Various process areas on-base.

3. **From:** The unit separates floating oil from wastewater generated by various process areas on-base. Waste oil is collected at the units and either used on site or disposed off site. The units are typically constructed of concrete and are generally covered with a metal lid. Many of the units overflow to NPDES discharge points.

4. **When:** It is assumed that the separators were typically constructed at the time of building construction

5. **Generated By:** The waste oil is either used on site (e.g., such as the waste oil used for starting fires at the Decontamination Burn Point) or disposed off site.

6. **Amount**: The Industrial Wastewater Treatment Study listed at least 15 separators associated with various buildings and process lines.

7. **Work Completed:**

   a. There is no known history of release from the units, and visual inspection of two units found no signs of release.

   b. This unit was included in the January 2002 Desktop Audit Decision Document, which was signed by the Navy and EPA with concurrence from the MDE on April 23, 2002.

8. **Current Status:** The decision reached during the desktop audit was that no action is required to be taken in connection with these units.

SWMU 74 – UNLINED OVERLAND DRAINAGE DITCHES

IRP AOC
Main Area SWMU 74
Fact Sheet

1. **Contamination:** Process wastewater containing various contaminants.

2. **Location:** Drainage ditches throughout the Activity.

3. **From:** Discharge of process wastewater to unlined overland drainage ditches.

4. **When:** Startup varies with each ditch. However, the practice of discharge in unlined ditches has been used since the beginning of production at the Activity.

5. **Generated By:** Various processes throughout the Activity.

6. **Amount**: Unknown

7. **Work Completed:** This unit was included in the January 2002 Desktop Audit Decision Document, which was signed by the Navy and EPA with concurrence from the MDE on April 23, 2002. The decision reached was this SWMU will remain an AOC, and additional work is needed to identify and verify ditches with potential contamination.

8. **Current Status:** A concurrence letter for no further action (NFA) was signed in February 2004 for this unit. The team agreed to administratively close out SWMU 74. Drainage ditches considered problematic have been addressed during investigations of them specifically or along with adjacent sites. Any ditches found to be a potential concern during future site investigations will be addressed by those investigations.

AOC G – SAND BLASTING SAND STORAGE AREA

(OLD MAP GRID B8)
IRP AOC
Main Area RCRA AOC G
Fact Sheet

1. **Contamination:** Sand blasting is used to remove paint from rocket motor casings. Sand blasting sand commonly contains heavy metals.

2. **Location:** The equipment is located indoors on a floor and containment area constructed of steel and concrete (Building 1134).

3. **From:** The sand is collected and continuously recycled to the sand blast equipment, resulting in no waste sand.

4. **When:** Unknown.

5. **Generated By:** The process is currently being converted to use a plastic medium (i.e., to replace the sand) for removal of the paint.

6. **Amount:** Unknown.

7. **Work Completed:** This unit was included in the January 2002 Desktop Audit Decision Document, which was signed by the Navy and EPA with concurrence from the MDE on April 23, 2002.

8. **Current Status:** The decision reached during the desktop audit was that no action is required to be taken in connection with this unit.

AOC H – DRUM AT FUEL STORAGE AREA

(OLD MAP GRID C8)
IRP AOC
Main Area RCRA AOC H
Fact Sheet

1. **Contamination:** During visual inspection of the vehicle maintenance area (Building 290), a single drum containing an unidentified liquid was observed adjacent to the nearby fuel storage area. There was no indication, however, that the contents of the drum were a waste (i.e., no signs that activities in the area would generate a waste). The drum was located outdoors on an asphalt roadway. There was no apparent leakage from the drum, and visual inspection found no signs indicating that the area was routinely used for storage of drums.

2. **Location:** Unknown.

3. **From:** Unknown.

4. **When:** Unknown.

5. **Generated By:** Unknown.

6. **Amount:** Unknown.

7. **Work Completed:** This unit was included in the January 2002 Desktop Audit Decision Document, which was signed by the Navy and EPA with concurrence from the MDE on April 23, 2002.

8. **Current Status:** The decision reached during the desktop audit was that no action is required to be taken in connection with this unit.

AOC 31 – BUILDING 259

IRP AOC 31
Fact Sheet

1. Contamination: Metals and energetics

2. Location: Building 259 – Old Storehouse / Detonator Production

3. From: Detonator production activities.

4. When: Building 259 is a former inert storehouse constructed in 1917. Detonator production activities occurred during World War I timeframe.

5. Generated By: Detonator production outside building. Lead azide was produced outside the building and cooled by water that ran through the trench.

6. Amount: Unknown.

7. Work Completed:

a. Pre-decontamination sampling results in January 2011 revealed elevated metals and energetics in soil outside the building. Subsequently, the team created new AOC 31 in the Navy Installation Restoration Program (IRP) to evaluate the new site.

b. The Final Site Screening Process (SSP) UFP-SAP Work Plan was submitted in July 2013. The SSP fieldwork was completed at AOC 31 along with IRP Site 69 in July 2013.

8. Current Status: Additional action is recommended at AOC 31 to address mercury in soil, potentially in the form of a non-time-critical removal action and will be completed when funding is available.

SWMU 20 / UXO 20 – SAFETY THERMAL TREATMENT POINT

(OLD MAP GRID F1)
IRP AOC
Main Area SWMU 20 / MRP Site UXO 20
Fact Sheet

1. **Contamination:** The Safety Thermal Treatment Point was an open burning area that operated in a manner similar to the Cast Plant Burn Point (SWMU 19). The unit was used for thermal treatment of explosive and flammable waste.

2. **Location:** The Safety Thermal Treatment Point is located west of the Cast Plant Burn Point on a small peninsula extending into the Potomac River (south of Building 1248).

3. **From:** The treatment point is an area of bare soil on the end of the peninsula where various explosive and flammable materials were burned. The Safety Thermal Treatment Point was used for burning of pyrotechnics including igniters, detonators, and other explosive devices.

   Like the Cast Plant Burn Point, the state of Maryland determined that the unit would require a RCRA permit under Subpart X regulations.

4. **When:** The start-up date of the unit is estimated to be the late 1940s or early 1950s.

5. **Generated By:** The unit was used for thermal treatment of explosive and flammable waste. The unit is an area of bare soil with no secondary containment preventing runoff into the river. The unit is designed to release to air. Some residue may remain from incomplete burning of the waste materials; however, facility representatives stated that the area was periodically "shocked" to remove any residual explosive or flammable material.

6. **Amount:** Unknown.

7. **Work Completed:**

   a. Cleanup of contaminated soil at the site in 1988 (removal of approximately 100 drums.)

   b. Completion of a site characterization report for the STTP as part of a RCRA closure effort. Lead was the chemical of concern.

   c. This unit was included in the January 2002 Desktop Audit Decision Document, which was signed by the Navy and EPA with concurrence from the MDE on April 23, 2002.

   d. The final Preliminary Assessment Report was completed in September 2005.

   e. A Site Inspection was completed in September 2010 and recommended a Remedial Investigation for munitions and explosives of concern (MEC) and munitions constituents (MC) in soil and groundwater.

   f. The Final Remedial Investigation (RI) Work Plan (along with completed Explosive Safety Submission) was submitted in November 2012.

8. **Current Status:** SWMU 20 has been included in the Munitions Response Program (MRP) and designated as Site UXO 020. MEC and MC field work (sampling and DGM survey) were completed

in May 2014. A UFP-QAPP and ESS are currently being prepared for phase II fieldwork (intrusive investigation of anomalies) which is planned for the summer of 2016.

SWMU 21 – CAFFEE ROAD DECONTAMINATION BURN POINT

(OLD MAP GRID L6)
IRP AOC
Main Area SWMU 21
Fact Sheet

1. **Contamination:** The Decontamination Burn Point is a thermal treatment open burn area for decontamination of scrap metal contaminated with explosive. The burn area had two large piles of scrap metal, one awaiting thermal treatment and a second, treated pile. The waste oil used to ignite and sustain the fire was stored in drums at a storage area near the burn point.

   Like the Cast Plant and Safety Burn Points, the state of Maryland determined that the Decontamination Burn Point would require a RCRA permit under Subpart X regulations.

2. **Location:** The unit lies at the south end of Caffee Road on top of the inactive Caffee Road Landfill and approximately 253 yards from Mattawoman Creek.

3. **From:** The metal was placed into a pile and ignited to remove any explosive contaminants by burning. Waste oil was used on the metal to ignite and sustain the fire. Following treatment, the metal was sold to off-site contractors as scrap.

4. **When:** This unit has been in operation since the Caffee Road Landfill was covered in the early 1980s.

5. **Generated By:** This unit is used for the thermal treatment of solids, including wood and metal contaminated with explosives. The contaminated material is burned with waste oil to aid combustion. Thermally treated material is periodically collected and sold as scrap. The unit is located on the soil cover over the Caffee Road Landfill.

6. **Amount:** Unknown.

7. **Work Completed:**

   a. Operations ceased, the scrap pile was removed, and the site was re-graded to address stormwater runoff issues in September 2001.

   b. Three mounds covered with CR-6 were built around the new planned burn area in November 2001.

   c. Conduits, a 6-foot by 6-foot equipment concrete pad, heat shields, and control panel were installed in April 2002, but the new treatment pad has not yet been used for thermal treatment operations.

   d. This unit was included in the January 2002 Desktop Audit Decision Document, which was signed by the Navy and EPA with concurrence from the MDE on April 23, 2002.

8. **Current Status:** The decision reached during the desktop audit was that this unit would be handled with Site 11. The remedial action at Site 11 also addresses this SWMU. See fact sheet for Main Area IRP Site 11.

UXO 13 – FDR SKEET RANGE

MRP Site UXO 13
Fact Sheet

1. **Contamination:** Lead, PAHs.

2. **Location:** The southeast portion of the main installation adjacent to Mattawoman Creek.

3. **From:** Recreational target practice.

4. **When:** 1940s to 1960s.

5. **Generated By:** Recreational munitions use that was limited to shotgun ammunition.

6. **Amount:** Unknown.

7. **Work Completed:**

   a. A final Preliminary Assessment Report was completed in September 2005 and recommended no further action (NFA) for munitions and explosives of concern (MEC), and a Site Inspection for munitions constituents (MC).

   b. A Site Inspection was completed in September 2010 and recommended a Remedial Investigation for MC in surface soil around the trap house and NFA for the shot fall area.

8. **Current Status:** The site was designated as Munitions Response Program (MRP) Site UXO 013. The Remedial Investigation for MC in surface soil around the trap house will begin when funding becomes available.

UXO 19 – IGNITER AREA

MRP Site UXO 19
Fact Sheet

1. **Contamination:** Explosives, lead styphnate.

2. **Location:** The southeastern shoreline of the main installation in the vicinity of Building 1451 and adjacent to Mattawoman Creek.

3. **From:** Disposal of igniters at the shoreline.

4. **When:** Unknown.

5. **Generated By:** Disposal of igniters described to be electric primers or electrically-primed rifle cartridges approximately .50 caliber in size.

6. **Amount:** Unknown.

7. **Work Completed:**

   a. The site was designated as Munitions Response Program (MRP) Site UXO 026 and was included in the Water Area Munitions Study (WAMS) which was completed in February 2005, and recommended an interim removal action for munitions and explosives of concern (MEC) and a Site Inspection for munitions constituents (MC).

   b. A shoreline munitions inventory was completed in January 2010.

   c. The Site Inspection was completed in September 2010 and recommended no further action (NFA) for MC in the sediment.

   d. A Final Interim Removal Action Work Plan was completed in January 2011 and the Final Explosive Safety Submission was completed in June 2012. The interim removal action (IRA) was completed in October 2012.

   e. A DGM Survey Work Plan to investigate the presence of potential items in the shallow water off the shoreline was completed in December 2012 and the DGM Survey fieldwork was completed in May 2013.

8. **Current Status:** A DGM Technical Memorandum was completed in June 2013. The site may require a Decision Document or Proposed Plan and ROD to incorporate land use controls. Additional work is delayed until guidance is provided from NAVFAC Headquarters on addressing water sites and funding is available.

UXO 29 – SOUTHWESTERN PISTOL RANGE

MRP Site UXO 29
Fact Sheet

1. **Contamination:** Lead and other munitions constituents such as antimony, arsenic, copper, nickel, and lead styphnate/lead azide.

2. **Location:** The western end of the main installation peninsula, between Drop Tower Drive and Pump House Lane, southwest of Building 739.

3. **From:** Small arms (pistol) training.

4. **When:** 1940s.

5. **Generated By:** Practice range firing of small arms. The site is also overlapped by The Valley firing fan.

6. **Amount:** Unknown.

7. **Work Completed:**

   a. A final Preliminary Assessment Report was completed in September 2005.

   b. The Site Inspection was completed in September 2010 and recommended no action for this site.

8. **Current Status:** The site was designated as Munitions Response Program (MRP) Site UXO 029. A draft Technical Memorandum that recommends NFA for the site was submitted in January 2010 but was never finalized. Instead, the information documenting NFA for this site was included in the Final Site Inspection. A no action Decision Document was signed in October 2011.

UXO 30 – GATE 3 BURNING GROUND

MRP Site UXO 30
Fact Sheet

1. Contamination: Flares, pyrotechnics, solid fuse boosters, bulk explosives, propellants, small arms ammunition.

2. Location: Near the intersection of Strauss Avenue and E. Caffee Road, along the Potomac River shoreline.

3. From: Burning of explosives.

4. When: 1955-1961.

5. Generated By: Burning of explosives.

6. Amount: Unknown.

7. Work Completed:

a. A final Preliminary Assessment Report was completed in September 2005 and recommended a Site Inspection for munitions and explosives of concern (MEC) and munitions constituents (MC) in surface soil, subsurface soil, and groundwater.

b. A Site Inspection was completed in September 2010 and recommended further investigation of MEC based on subsurface anomalies and a Remedial Investigation for MC in soil and groundwater.

8. Current Status: The site was designated as Munitions Response Program (MRP) Site UXO 030. The MEC and MC Remedial Investigations will begin when funding becomes available.

UXO 33 – WATER IMPACT AREA

MRP Site UXO 33
Fact Sheet

1. **Contamination:** Naval ordnance constituents: explosives, black powder, smokeless powder, brown powder, emmensite, joveite, wet gun cotton, randite, and thorite.

2. **Location:** Located within the Potomac River between Chapman's Point, Maryland and the mouth of the Chicamuxen River encompassing approximately 12,296 acres.

3. **From:** Testing and development of ordnance that may have strayed from targets.

4. **When:** 1890s to 1920s.

5. **Generated By:** Guns and rockets fired from the Valley that may have missed intended impact areas and landed in the Water Impact Area.

6. **Amount:** Unknown.

7. **Work Completed:**

   a. The site was designated as Munitions Response Program (MRP) Site UXO 024 and was included in the Water Area Munitions Study (WAMS) which was completed in February 2005.

   b. A Site Inspection (SI) was completed in September 2010 and recommended no action for munitions and explosives of concern (MEC) and munitions constituents (MC).

8. **Current Status:** The site was initially identified as UXO 024, but has been re-designated as UXO 033. Although the SI recommended no action for the site, it recommended that the existing Danger Zone on the NOAA maps be expanded to include the potential impact area from UXO 033, updating the current site use, and restricting intrusive activities. This site may be investigated further in the future.

2.2 SITE DESCRIPTIONS – STUMP NECK ANNEX

This section consists of fact sheets for the Stump Neck sites and AOCs.

SITE 30 / SWMU 22 / UXO 10 – STUMP NECK IMPACT AREA

(OLD MAP GRID F16, G16)
IRP Site 30 / Stump Neck Annex SWMU 22 / MRP Site UXO 10
Fact Sheet

1. Contamination: Exploded ordnance.

2. Location: The area is approximately 40 acres of marshland.

3. From: According to facility representatives, this area was used for testing of single-base, powder-fired projectiles.

4. When: The unit was reportedly used before World War II.

5. Generated By: Projectile testing.

6. Amount: Unknown.

7. Work Completed:

a. No projectiles have been recovered from the area.

b. The 1990 EPA RCRA Corrective Action Permit stated that no further action (NFA) was necessary at the time.

c. A Preliminary Assessment (PA) Report was completed in September 2005, recommending the area be investigated for MEC.

d. A Site Inspection (SI) Report was completed in September 2010, recommending a Remedial Investigation (RI) for munitions and explosives of concern (MEC) and NFA for munitions constituents (MC).

8. Current Status: Currently designated as Munitions Response Program (MRP) Site UXO 010. The Remedial Investigation (RI) for MEC will begin when funding becomes available.

SITE 31 / SWMU 23 / UXO 7 – OLD DEMOLITION RANGE

IRP Site 31 / Stump Neck Annex SWMU 23 / MRP Site UXO 7
Fact Sheet

1. **Contamination:** Small quantities of shrapnel and casings from detonation of explosives.

2. **Location:** The area is approximately 1 acre in size. This unit is in the immediate vicinity of the Chicamuxen Creek's Edge Dump Site B (SWMU 4).

3. **From:** Training activities at the site are believed to have been similar to those now practiced at Range 6 (SWMU 5), an explosive ordnance disposal training range.

4. **When:** Used in 1962, and for many years prior to 1962, as an old demolition training ground.

5. **Generated By:** Explosive Ordnance Disposal (EOD) training.

6. **Amount:** Small quantities of shrapnel and casings.

7. **Work Completed:**

   a. The 1990 EPA RCRA Corrective Action Permit stated that no further action (NFA) was necessary at the time.

   b. A Preliminary assessment (PA) started in June 2003. The PA Report was completed in September 2005.

8. **Current Status:** Currently designated as Munitions Response Program (MRP) Site UXO 007. Because this site is collocated with an active range (Hypervelocity Gun), it is ineligible for further action under CERCLA. A No Action Decision Document was signed in October 2005.

SITE 32 / SWMU 11 – SUSPECTED TOOL BURIAL SITE

IRP Site 32
(Stump Neck Annex SWMU 11)
Fact Sheet

1. Contamination: Beryllium-copper alloy.

2. Location: Vicinity of Building 31 Stump Neck.

3. From: Hand tools used in explosive ordnance disposal work.

4. When: Unknown.

5. Generated By: This unit is suspected to contain special beryllium-copper alloy hand tools used in explosive ordnance work.

6. Amount: Unknown.

7. Work Completed:

a. During the visual site inspection, the unit was covered with grass and rimmed by sparse woods. Facility representatives indicated the burial site's approximate size was 10 feet by 10 feet.

b. The 1990 EPA RCRA Corrective Action Permit stated that no further action (NFA) was necessary at the time.

c. This site was subjected to a Site Screening Process (SSP) during 2002. Because the site is so similar to Site 34 with respect to the potential sources of contamination, the work plan allowed for not pursuing the investigation of Site 32 if the results from the Site 34 investigation indicated that no action was appropriate. Since the results of the Site 34 investigation indicated no reason to pursue Site 32, no field investigation was performed.

d. The SSP Report was finalized in March 2003.

8. Current Status: A No Action Decision Document was signed by the Navy and the EPA with concurrence from the MDE in June 2003.

SITE 33 / SWMU 7 – SCRAP METAL PIT

(OLD MAP GRID O16)
IRP Site 33 / Stump Neck Annex SWMU 7
Fact Sheet

1. **Contamination:** Metal parts of mines, torpedoes, and other explosive-inert items.

2. **Location:** The exact location of the Scrap Metal Pit could not be identified. The area is southwest of Building 2117.

3. **From:** Used as a disposal pit for mines and torpedoes. This unit is an outdoor, unlined earthen area that measures approximately 10 feet by 30 feet by 10 feet deep.

4. **When:** Prior to 1983.

5. **Generated By:** Disposed wastes include metal objects (parts of mines, torpedoes, and other inert materials) derived from the manufacture of explosives.

6. **Amount:** Unknown.

7. **Work Completed:**

   a. During the visual site inspection in July 1988, the area was covered with grass and brier and was sparsely lined with trees. The area had been re-forested approximately two years earlier.

   b. The 1990 EPA RCRA Corrective Action Permit stated that no further action (NFA) was necessary at the time.

   c. A Site Screening Process (SSP) field investigation was completed in 2002. The field investigation included a geophysical survey; temporary monitoring wells with groundwater samples analyzed for Target Analyte List (TAL) metals and explosives; subsurface soil samples analyzed for TAL metals and explosives; and test pits located based on the results of the geophysical survey.

   d. The SSP Report was finalized in March 2003.

8. **Current Status:** A No Action Decision Document was signed in October 2004.

SITE 34 / SWMU 8 – TOOL BURIAL SITE

(OLD MAP GRID E15)
IRP Site 34 / Stump Neck Annex SWMU 8
Fact Sheet

1. Contamination: Beryllium-copper alloy.

2. Location: Located approximately 60 to 70 feet into a wooded area southeast of Building D21C.

3. From: Two unlined burial pits, each measuring about 5 feet by 15 feet by 12 feet deep. The volume of tools in each pit is reported to be about 5 feet by 8 feet by 2 feet.

4. When: Used once in 1972 or 1973. Beryllium-copper alloy hand tools were disposed in the pits. These tools were discarded because they did not pass a magnetometer test and were considered unserviceable.

6. Amount: Unknown.

7. Work Completed:

a. The 1990 EPA RCRA Corrective Action Permit stated that no further action (NFA) was necessary at the time.

b. A Site Screening Process (SSP) field investigation was completed in 2002. The field investigation included a geophysical survey; temporary monitoring wells with groundwater samples analyzed for beryllium and copper; subsurface soil samples analyzed beryllium, copper, and explosives; and test pits located based on the results of the geophysical survey.

c. The SSP Report was completed in March 2003.

8. Current Status: A No Action Decision Document was signed by the Navy and the EPA with concurrence from the MDE in June 2003.

SITE 35 / SWMU 9 / UXO 12 – TORPEDO BURIAL SITE

(OLD MAP GRID E14, E15)
IRP Site 35 / Stump Neck Annex SWMU 9 / MRP Site UXO 12
Fact Sheet

1. **Contamination:** Torpedoes and associated hardware, possibly containing fuses and parts which are not rendered safe.

2. **Location:** Located near Building 2075.

3. **From:** The unit is an unlined earthen pit. Inert objects disposed in this unit included discarded torpedo shells and associated hardware.

4. **When:** Used in the late 1940s and early 1950s and inactive since the early 1950s

5. **Generated By:** The waste was transported from a torpedo station near Washington, D.C.

6. **Amount:** Unknown.

7. **Work Completed:**

   a. During the visual site inspection the area appeared flat and was covered with green grass. The perimeter of the unit is wooded and an unnamed creek dissects the area.

   b. The 1990 EPA RCRA Corrective Action Permit stated that no further action (NFA) was necessary at the time.

   c. A Preliminary Assessment (PA) Report was completed in September 2005, recommending an investigation for MEC.

   d. A Site Investigation (SI) Report was completed in September 2010.

8. **Current Status:** Currently designated as Munitions Response Program (MRP) Site UXO 012. A UFP-SAP Work Plan and ESS were finalized in August 2015. Remedial Investigation (RI) fieldwork is planned for fall 2015.

SITE 36 / SWMU 10 – CLOSED LANDFILL

(OLD MAP GRID H14, H15)
IRP Site 36 / Stump Neck Annex SWMU 10
Fact Sheet

1. **Contamination:** Inert metal casings, mines, bombs, and torpedoes.

2. **Location:** Near Building 2010; west of Roach Road adjacent to Chickamuxen Creek.

3. **From:** Objects disposed in the landfill included metal casings, mines, bombs, and torpedoes, which reportedly were inert and contained no explosives or chemicals when buried.

4. **When:** Used from 1972 to 1974; inactive since 1974.

5. **Generated By:** Unknown.

6. **Amount:** Unknown.

7. **Work Completed:**

   a. The Initial Assessment Study describes a landfill that consists of two distinct adjacent areas. The unit is an unlined, earthen area, approximately 1 to 2 acres in size, and is covered with grass and other low vegetation. The unit is contiguous with a wetland area and is rimmed by sparse woods.

   b. During the visual site inspection, tall grass covered the area, and the soil was dark with a low brier ground cover.

   c. The 1990 EPA RCRA Corrective Action Permit stated that no further action (NFA) was necessary at the time.

   d. A Site Screening Process (SSP) field investigation was completed in 2002. According to the work plan, the field investigation was limited to a geophysical survey.

   e. The SSP Report was completed in March 2003.

   f. A Benthic Study was completed in November 2007.

   g. The SSP Report was completed in May 2008. The report concluded that here were potential unacceptable risks to human health under a residential exposure scenario. The report recommended a Feasibility Study (FS) to evaluate alternatives that would address potential risks to human health and the environment.

   h. The FS Report was completed in March 2010.

   i. A Proposed Plan was finalized in April 2010, recommending removal of surface debris and Institutional Controls (ICs) along with long-term monitoring (LTM) at the site. A public meeting was held on April 15, 2010.

   j. The Record of Decision (ROD) was signed in September 2011.

k. A landfill maintenance work plan addendum (for debris removal) was completed in October 2013. An Explosive Safety Submission (ESS) for the debris removal was submitted to Naval Ordnance Safety and Security Activity (NOSSA). Debris removal fieldwork was completed in April 2014. A Remedial Action Completion Report (RACR) was finalized in September 2014.

8. Current Status: The site is currently in the LTM phase. Groundwater LTM began in 2014 following finalization of the UFP-SAP Work Plan.

SITE 37 / SWMU 24 – CAUSEWAY

(OLD MAP GRID E13)
IRP Site 37 / Stump Neck Annex SWMU 24
Fact Sheet

1. **Contamination:** Causeway fill, which is primarily rubble partly composed of old torpedo casings.

2. **Location:** The access road to the ranges at Stump Neck crosses a narrow neck of land. The causeway is directly adjacent to the Potomac River.

3. **From:** The narrow neck of land has been built up with fill material.

4. **When:** Unknown.

5. **Generated By:** Shore stabilization.

6. **Amount:** Unknown.

7. **Work Completed:**

   a. Observation of the area indicated the presence of a raised land area and use of concrete blocks and rock to protect the Potomac River side of the roadway from erosion for a distance of 300 to 400 feet. Along the river's edge, there was a small beach which was rimmed with rip-rap wrapped in wire mesh. During the visual site inspection, the unit appeared relatively flat and grassy.

   b. The 1990 EPA RCRA Corrective Action Permit stated that no further action (NFA) was necessary at the time.

   c. A Site Screening Process (SSP) field investigation was completed in 2002. The field investigation included the installation of temporary monitoring wells with groundwater, soil, sediment, and surface water samples analyzed for Target Compound List (TCL) volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), pesticides, and polychlorinated biphenyls (PCBs); Target Analyte List (TAL) metals; and explosives.

   d. The SSP Report was completed in March 2003, recommending a Remedial Investigation (RI).

   e. During scoping of the RI for Site 37, the team identified the need for further SSP investigation prior to entering the RI phase, because no waste was encountered during the 2002 SSP effort.

   f. The additional (i.e., Phase 2) SSP fieldwork was conducted in June 2011. No waste was encountered in eight soil borings and two test trenches. The Phase 2 SSP Report was finalized in October 2011. The report recommended no action—because no waste was used to build up the Causeway, no CERCLA response is necessary.

8. **Current Status:** A No Action Decision Document was signed in November 2011.

SITE 38 / SWMU 1 – RUM POINT LANDFILL

(OLD MAP GRID U7)
IRP Site 38 / Stump Neck Annex SWMU 1
Fact Sheet

1. **Contamination:** Various unknown containers and metals in addition to ash from a thermal treatment tank.

2. **Location:** West of Rum Point Road.

3. **From:** The unit is an unlined landfill that is approximately 1.5 to 2 acres in size.

4. **When:** Until December 1989.

5. **Generated By:** Ash from a thermal treatment tank, located on Range 3 Burn Point, was reportedly disposed here one time.

6. **Amount:** Unknown.

7. **Work Completed:**

   a. The site was identified in the Initial Assessment Study (IAS) of the Naval Assessment and Control of Installation Pollutants (NACIP) Program. The IAS report indicated disposal of several metal objects, including garbage cans and drums.

   b. As required by the Naval Explosive Ordnance Disposal Technology Center (NEODTC) RCRA Corrective Action Permit, an RCRA Facility Investigation (RFI) / Verification Investigation (VI) Report was completed (draft) in January 1998. That document recommended that a no further action (NFA) decision be considered for this site.

   c. A Site Screening Process (SSP) effort and report were completed in June 2008. The report concluded that there were potential unacceptable risks to human health under a residential exposure scenario. A Feasibility Study (FS) was recommended to evaluate alternatives that would address potential risks to human health and the environment.

   d. Pre-FS waste delineation efforts were conducted in 2010. The Draft FS was submitted in January 2011.

   e. A Draft Proposed Plan was submitted in January 2011, recommending a cap-in-place remedy. A Draft Record of Decision (ROD) was submitted in June 2011.

   f. To help with the cover system design and/or to evaluate a potential dig and haul alternative, additional trenching activities to determine the thickness of waste on the site boundaries were conducted in June 2011. Material Potentially Presenting an Explosive Hazard (MPPEH) items were encountered, stopping the field activity.

   g. Following approval of an Explosive Safety Submission (ESS) by Naval Ordnance Safety and Security Activity (NOSSA), additional test pits were installed in May 2012 using unexploded ordnance (UXO) safety protocols. No munitions and explosives of concern (MEC) items were found during test pitting activities.

h. The FS Report was finalized in June 2013. The 2011 and 2012 test pitting results indicated significantly less volume of buried waste than was assumed in the Draft FS Report. The Final FS Report included detailed development of a dig and haul alternative for buried waste and contaminated soil, followed by a groundwater evaluation (i.e., groundwater long-term monitoring [LTM]).

i. The Final Proposed Plan was completed in July 2013. The Preferred Remedy is excavation and offsite disposal of buried waste and impacted soils, land use controls (LUCs), and groundwater long-term monitoring (LTM) to evaluate changes in manganese concentrations. A public meeting was held on August 21, 2013.

8. Current Status: The Final Record of Decision (ROD) was signed in June 2014. An ESS was finalized in July 2015 and RA fieldwork is expected to begin in fall 2015.

SITE 58 / SWMU 2 – RANGE 3 BURN POINT

IRP Site 58 / Stump Neck Annex SWMU 2
Fact Sheet

1. **Contamination:** Unknown explosives, waste ash, and petroleum.

2. **Location:** Bank of Chicamuxen Creek. This unit is located downhill and slightly southwest of the Pink Water Treatment Tank (SWMU 13). The Range 3 Burn Point is located within the 100-year flood plain.

3. **From:** The unit is used for burning or thermal treatment of explosive wastes, explosive-contaminated materials, and carbon.

4. **When:** Currently in use.

5. **Generated By:** The Range 3 Burn Point is used to periodically burn or thermally treat explosive wastes generated at the facility and is a RCRA-regulated unit. The wastes are burned either directly on bare soil using gasoline as an ignition source or in a Thermal Treatment Tank (SWMU 16) that rests on bare soil approximately 15 to 30 feet from the Creek's edge. This area also contains a metal container used to test small blasting caps (squibs).

6. **Amount:** Unknown.

7. **Work Completed:**

   a. During the visual site inspection, burned scraps were observed in the container, and charred debris was observed on the soil in the immediate vicinity of the Thermal Treatment Tank. A paint solvent or paint odor was detected close to the creek, approximately 15 feet from the Thermal Treatment Tank.

   b. As required by the Naval Explosive Ordnance Disposal Technology Center (NEODTC) RCRA Corrective Action Permit, a RCRA Facility Investigation (RFI) / Verification Investigation (VI) Report was completed (draft) in January 1998. That document recommended that a no further action (NFA) decision be considered for this site.

8. **Current Status:** Currently designated as an active range and will not be addressed under the Installation Restoration Program (IRP).

SITE 59 / SWMU 3 – CHICAMUXEN CREEK'S EDGE DUMP SITE A

IRP Site 59 / Stump Neck Annex SWMU 3
Fact Sheet

1. **Contamination:** Unknown.

2. **Location:** This unit is located directly under the Range 3 Burn Point (SWMU 2). Exactly what was dumped in this unit is not known. There are indications that the earthen area which comprises this unit and the Range 3 Burn Point (SWMU 2) are man-made fill areas. The unit is located adjacent to Chicamuxen Creek within the 100-year flood plain. The unit is surrounded on three sides by a rip-rap berm covered with wire mesh.

3. **From:** Potential contamination associated with filling operations.

4. **When:** Unknown.

5. **Generated By:** Unknown.

6. **Amount:** The unit is approximately 2 acres in size and is covered with bare soil.

7. **Work Completed:** As required by the Naval Explosive Ordnance Disposal Technology Center (NEODTC) RCRA Corrective Action Permit, a RCRA Facility Investigation (RFI) / Verification Investigation (VI) Report was completed (draft) in January 1998. That document recommended that a no further action (NFA) decision be considered for this site.

8. **Current Status:** Currently designated as an active range and will not be addressed under the Installation Restoration Program (IRP).

SITE 60 / SWMU 4 – CHICAMUXEN CREEK'S EDGE DUMP SITE B

IRP Site 60 / Stump Neck Annex SWMU 4
Fact Sheet

1. **Contamination:** This unit was used as a dump site but facility representatives were uncertain of the exact nature of materials disposed.

2. **Location:** Immediate vicinity of the Old Demolition Range (SWMU 23).

3. **From:** This unit is an unconfined earthen area located adjacent to Chicamuxen Creek.

4. **When:** Unknown.

5. **Generated By:** Unknown.

6. **Amount:** Unknown.

7. **Work Completed:**

   a. No release controls associated with this unit. During the Visual Site Inspection (VSI), the unit was covered with grass, and a sparse stand of trees separated the area from the water's edge.

   b. As required by the Naval Explosive Ordnance Disposal Technology Center (NEODTC) RCRA Corrective Action Permit, a RCRA Facility Investigation (RFI) / Verification Investigation (VI) Report was completed (draft) in January 1998.

8. **Current Status:** Designated as part of Site 31 – Old Demolition Range (UXO 007), which was investigated under the Preliminary Assessment (PA) in 2005. Since this site is collocated with an active range (Hypervelocity Gun), it is ineligible for further action under CERCLA. A No Action Decision Document was signed in October 2005.

SITE 61 / SWMU 5 – RANGE 6

IRP Site 61 / Stump Neck Annex SWMU 5
Fact Sheet

1. Contamination: Explosives. The area was used as a demolition range. The site consists of five ranges that were used for open detonation training. Small amounts (less than 2 to 3 pounds) of explosives were used. Unexploded ordnance was open-detonated in place.

2. Location: Range 6 is located at the end of Archer Avenue, on a point of land extending into the Potomac River and Chicamuxen Creek. This unit is located within the 100-year flood plain.

3. From: Wastes that were managed in this unit include small quantities of shrapnel and casings from detonation of explosives.

4. When: This unit has been phased out since the Explosive Ordnance Disposal (EOD) school relocated to Florida during early 1998.

5. Generated By: EOD school training.

6. Amount: This unit was used on a weekly basis, depending on the number of recruits at any given time.

7. Work Completed:

a. A Verification Investigation (VI) was completed in June 1996. The VI Report recommended additional field investigation.

b. As required by the Naval Explosive Ordnance Disposal Technology Center (NEODTC) RCRA Corrective Action Permit, a RCRA Facility Investigation (RFI) / Verification Investigation (VI) Report was completed in draft in January 1998. That document recommended consideration for implementing a feasibility study or land use restrictions.

8. Current Status: Currently designated as an active range and will not be addressed under the Installation Restoration Program (IRP).

SITE 62 / SWMU 6 / UXO 1 – AIR BLAST POND

(OLD MAP GRID F15)
IRP Site 62 / Stump Neck Annex SWMU 6 / MRP Site UXO 1
Fact Sheet

1. **Contamination:** Explosives include Pentolite, HBX1, HBX2, H6, and C4 Propellant (similar to lead azide).

2. **Location:** Adjacent to Chicamuxen Creek near industrial outfall IW 32.

3. **From:** Explosives testing.

4. **When:** Used by the facility from 1955 to 1975; has not been in service for 15 to 20 years.

5. **Generated By:** The unit consists of an unlined earthen pit, measuring approximately 100 feet in diameter, with a capacity of 1.3 million gallons. During operation, explosives were detonated above water and in water during testing. The pit was filled with water from Chicamuxen Creek through a steel, 14-inch-diameter pipe at a rate of 1,300 gallons per minute. Wire was strung across the pit to measure the concussion factor of explosives above water. The water in the pond was periodically discharged into Chicamuxen Creek through the same pipe (IW 32). The pond was emptied two to three times per year. The unit is located in a wooded area of the facility.

6. **Amount:** According to an interview of a former facility employee conducted by the Naval Explosive Ordnance Disposal Technology Center, a maximum of 8 pounds of explosives were used per detonation event (shot). During the unit's period of operations, three to four shots were conducted per day, with an estimated total of 1,500 shots over the unit's active life.

7. **Work Completed:**

   a. As required by the Naval Explosive Ordnance Disposal Technology Center (NEODTC) RCRA Corrective Action Permit, a RCRA Facility Investigation (RFI) / Verification Investigation (VI) Report was completed (draft) in January 1998. That document recommended consideration of no action for this site.

   b. A Preliminary Assessment (PA) Report was completed in September 2005, recommending a Site Inspection (SI) for munitions and explosives of concern (MEC).

   c. An SI Report was completed in September 2010, recommending a Remedial Investigation (RI) for munitions and explosives of concern (MEC) and no action for munitions constituents (MC).

8. **Current Status:** Currently designated as Munitions Response Program (MRP) Site UXO 001. The RI for MEC will begin when funding becomes available.

SITE 63 / SWMU 25 / UXO 2 – AREA 8

IRP Site 63 / Stump Neck Annex SWMU 25 / MRP Site UXO 2
Fact Sheet

1. **Contamination:** Area 8 was an active facility used to train military personnel to defuse explosive devices. Explosives were detected in sediment samples collected at Area 8.

2. **Location:** Located on Roach Road. Access to the site is controlled by a fence and a gate located on Archer Avenue. Area 8 is approximately 9.6 acres in size.

3. **From:** At the water-shot locations, the explosive was placed 2 to 5 feet below the water surface. At the air-shot locations, the explosive was suspended (on wire) approximately 2 feet above ground. The types of ordnance used included TNT stock, PETN, military dynamite, blasting caps, detonation cord, and similar devices.

4. **When:** EOD School relocated in 1998.

5. **Generated By:** EOD School training.

6. **Amount:** Training exercises at Area 8 were performed 10 months a year. It is estimated that approximately 50 to 75 pounds (net explosive weight) of explosives were used at this training facility each year. No more than 0.5 pound of explosives were used at the air- or water-shot locations during training exercises.

7. **Work Completed:**

   a. A Verification Investigation (VI) was completed in January 1996. The report recommended no further remedial action for the site, because contaminants detected at the site are unlikely to pose a risk to human health and the environment based on a future industrial land use scenario.

   b. A Preliminary Assessment (PA) Report was completed in September 2005, recommending a Site Inspection (SI) for MEC.

   c. An SI Report was completed in September 2010, recommending a Remedial Investigation (RI) for munitions and explosives of concern (MEC) and no further action (NFA) for munitions constituents (MC).

8. **Current Status:** Currently designated as Munitions Response Program (MRP) Site UXO 002. The RI for MEC will begin when funding becomes available.

SITE 64 / SWMU 26 / UXO 4 – IMPROVISED EXPLOSIVE DEVICES (IED) SITE

IRP Site 64 / Stump Neck Annex SWMU 26 / MRP Site UXO 4
Fact Sheet

1. **Contamination:** Training operations were performed at this site to demonstrate that household and other easily obtained chemicals could be used to make IEDs. During these operations, small amounts of residual waste were discarded on the ground. These waste chemicals included small amounts of silver nitrate.

2. **Location:** Near Building 2118.

3. **From:** Residual waste discarded on the ground.

4. **When:** Since November 1957, the IED has been used to test and demonstrate the explosive potential of chemical mixtures.

5. **Generated By:** Training demonstrations.

6. **Amount:** Unknown.

7. **Work Completed:**

   a. A verification investigation was completed in January 1996. The report recommended no further remedial action for the site, because contaminants detected at the site are unlikely to pose a risk to human health and the environment based on a future industrial land use scenario.

   b. A Preliminary Assessment (PA) Report was completed in September 2005, recommending a Site Inspection (SI) for munitions and explosives of concern (MEC).

   c. An SI Report was completed in September 2010, recommending a Remedial Investigation (RI) for munitions and explosives of concern (MEC) and no further action (NFA) for munitions constituents (MC).

8. **Current Status:** Currently designated as a closed range and included in the Munitions Response Program (MRP) as Site UXO 004. A UFP-SAP Work Plan and ESS were finalized in August 2015. Remedial Investigation (RI) fieldwork is planned for fall 2015.

SITE 65 / SWMU 27 / UXO 5 – INERT ORDNANCE DISPOSAL (IOD) SITE

IRP Site 65 / Stump Neck Annex SWMU 27 / MRP Site UXO 5
Fact Sheet

1. **Contamination:** This site consists of a cement bunker where inert ordnance and inert training aids were discarded.

2. **Location:** South of Building 2074SN.

3. **From:** Historical activities at the IOD are not well documented, but the site was apparently used for disposal of inert ordnance.

4. **When:** The initial date when the scrap metal was discarded is unknown.

5. **Generated By:** Based on current information, only inert metal scrap was placed in this bunker. A layer of cement was poured over the metal scrap.

6. **Amount:** Unknown.

7. **Work Completed:**

   a. A verification investigation was completed in January 1996. The report recommended no further remedial action for the site, because contaminants detected at the site are unlikely to pose a risk to human health and the environment based on a future industrial land use scenario.

   b. A Preliminary Assessment Report was completed in September 2005, recommending a Site Inspection (SI) for MEC.

   c. An SI Report was completed in September 2010, recommending a Remedial Investigation (RI) for munitions and explosives of concern (MEC) and no further action (NFA) for munitions constituents (MC).

8. **Current Status:** Currently designated as Munitions Response Program (MRP) Site UXO 005. A UFP-SAP Work Plan and ESS were finalized in August 2015. Remedial Investigation (RI) fieldwork is planned for fall 2015.

SWMU 12 – WASTE OIL STORAGE SITE

(OLD MAP GRID D15)
IRP AOC
Stump Neck Annex SWMU 12
Fact Sheet

1. **Contamination:** Waste oil.

2. **Location:** Designated area of storage lot near Building 2019.

3. **From:** Waste oil is stored in 55-gallon drums on wooden pallets in an asphalt-covered area surrounded by a chain-link fence.

4. **When:** Since approximately 1985.

5. **Generated By:** The waste oil is generated by vehicle maintenance operations and employee self-help oil changes at NAVEODTECHCEN. The waste is periodically collected from the storage site by Property Disposal (located off-site at NSFIH) for off-site recycling or disposal.

6. **Amount:** Unknown.

7. **Work Completed:**

   a. The 1990 EPA RCRA Corrective Action Permit stated that no further action (NFA) was necessary at the time.

   b. This unit was included in the January 2002 Desktop Audit Decision Document, which was signed by the Navy and the EPA with concurrence from the MDE, on April 23, 2002.

8. **Current Status:** The decision reached during the desktop audit was that NFA is required to be taken in connection with this unit.

SWMU 13 – PINK WATER TREATMENT TANK AND ASSOCIATED TRENCHES

IRP AOC
Stump Neck Annex SWMU 13
Fact Sheet

1. **Contamination:** TNT, RDX, and various other forms of explosives. Types of explosives treated at the unit have included Tolite, RDX, RDX/Octal, TNT, Comp B, TD-50, H-6, and Black Powder. Spent carbon contaminated with explosives (KO45).

2. **Location:** Building 2057, northeast of the Range 3 Burn Point (SWMU 2).

3. **From:** "Pink water" (K047) that is contaminated with explosive residue. This contaminated water is collected and treated on site at the Pink Water Treatment Tank.

4. **When:** Used from April until October each year since the permit was granted on November 14, 1985.

5. **Generated By:** Pink water is generated at the facility by a process in which explosive residues are removed from various types of ordnance. The treatment unit is a RCRA-regulated unit. The explosive is removed by steaming the interior of the ordnance casing.

   The contaminated water is collected and treated on site at the Pink Water Treatment Tank. As the pink water is generated during steaming, the water is collected in a concrete trench that directs the waste to a 1,500-gallon stainless-steel collection tank. The collection tank and additional treatment units are located in below-ground, concrete secondary containment structures. Treatment consists of filtering to remove solid explosive particles and activated carbon adsorption for removal of organic constituents. The carbon filters are assembled in two inline, 55-gallon drums. Following treatment, the water is discharged through a plastic pipe to NPDES outfall IW 49 on Chicamuxen Creek. The filter materials are periodically thermally treated at the Range 3 Burn Point (SWMU 2), and the spent carbon (K045) is shipped off site for disposal.

6. **Amount:** Unknown.

7. **Work Completed:**

   a. The facility was authorized to treat pink water from TNT operations under Controlled Hazardous Substances Facility Permit Number A-223a, issued by the MDE. The permit is dated November 14, 1985, authorizes the K047 waste to be treated by filtration and activated carbon adsorption. Filtration sludges (K045) are drummed and shipped off site for disposal. The 1990 EPA RCRA Corrective Action Permit stated that no further action (NFA) was necessary at the time.

   b. This unit was included in the January 2002 Desktop Audit Decision Document, which was signed by the Navy and the EPA with concurrence from the MDE, on April 23, 2002.

8. **Current Status:** The decision reached during the desktop audit was that this unit should continue to be managed within the RCRA Closure process.

SWMU 14 – PHOTOGRAPHIC LAB SEPTIC TANK SYSTEM

IRP AOC
Stump Neck Annex SWMU 14
Fact Sheet

1. Contamination: Possible dilute amounts of silver, sodium thiosulfate, and hydroquinone.

2. Location: Near Photographic Lab, Building 22SN and X-ray facility, Building 2009, below-ground tank and associated collection and discharge lines and drain field.

3. From: Discharge of spent fixer and developer from film development.

4. When: Unknown.

5. Generated By: In the past, this unit handled wastewater from the photographic lab, which may have contained dilute amounts of silver, sodium thiosulfate, and hydroquinone.

Waste fixers containing silver were drummed and transported off site for silver recovery. The unit handled sanitary wastewater only and was inspected weekly; in accordance with NPDES permit conditions sampling is conducted monthly.

The effluent is chlorinated and discharged to the Potomac River under NPDES permit MD0020885, which was issued in May 1988 and expired in April 1993. In addition, dilute photographic wastewater is discharged to the Potomac River via NPDES permit #NMOOO3158 (EPA) and #88-DP-2515 (MDE).

7. Work Completed:

a. After the visual site inspection, a new septic system was installed, eliminating surface discharge to the Potomac River.

b. The 1990 EPA RCRA Corrective Action Permit stated that no further action (NFA) was necessary at the time.

c. This unit was included in the January 2002 Desktop Audit Decision Document, which was signed by all Remedial Project Managers on April 23, 2002. The decision reached was that, due to lack of information available, the unit should be retained as an area of concern pending additional investigation.

d. A Site Screening Process (SSP) Investigation was started in April 2004. Sampling was completed in October 2005. A Draft SSP report was submitted in September 2006 which recommended further investigation for this site. An additional investigation was completed in July 2007 that identified cobalt in groundwater. The final SSP Report was submitted in June 2009 and recommended that the site proceed to a Remedial Investigation (RI).

e. The Final Remedial Investigation Work Plan was completed in June 2011, with initial RI field work being completed in October 2011. Results from the initial round of RI sampling did not fully delineate groundwater and surface soil contamination at the site, and an additional round of sampling was conducted in August 2012.

8 **Current Status:** The RI Report was finalized in April 2014. A Pilot Study Work Plan to evaluate options for treatment of cobalt in groundwater was finalized in March 2015. Pilot Study fieldwork began in July 2015 and follow-up monitoring is expected to last one year.

SWMU 15 – SPENT PHOTOGRAPHIC SOLUTION STORAGE

(OLD MAP GRID G11)
IRP AOC
Stump Neck Annex SWMU 15
Fact Sheet

1. **Contamination:** Silver, sodium thiosulfate, and hydroquinone.

2. **Location:** Photographic Laboratory, Building 22SN.

3. **From:** The visual site inspection (VSI) team observed a drum containing spent photographic solution staged outside the building.

4. **When:** At the time of the VSI in 1989.

5. **Generated By:** Spent photographic solution is collected and stored at the Photographic Laboratory, Building 22SN. The spent photographic solution is stored in a 50-gallon polyethylene tank prior to shipment off site for silver recovery.

6. **Amount:** One 55-gallon drum

7. **Work Completed:**

   a. According to information provided by the facility after the VSI, the drums are normally staged indoors until they are transferred off site. The drum observed during the VSI was prematurely moved outside for shipment.

   b. The 1990 EPA RCRA Corrective Action Permit stated that no further action (NFA) was necessary at the time.

   c. This unit was included in the January 2002 Desktop Audit Decision Document, which was signed by the Navy and the EPA with concurrence from the MDE, on April 23, 2002.

8. **Current Status:** The decision reached during the desktop audit was that no action is required to be taken in connection with this unit.

SWMU 16 – THERMAL TREATMENT TANK

IRP AOC
Stump Neck Annex SWMU 16
Fact Sheet

1. **Contamination:** The Thermal Treatment Tank is used for burning explosives and explosive-contaminated items.

2. **Location:** Range 3 Burn Point (SWMU 2). Ash was observed on bare soil immediately beneath and around the unit.

3. **From:** The Thermal Treatment Tank is an open-top, steel tank used for burning explosives and explosive-contaminated items. The tank is approximately 5 feet tall by 3 feet wide.

4. **When:** Currently active.

5. **Generated By:** Ash from the Thermal Treatment Tank was disposed one time in the Rum Point Landfill (SWMU 1). The ash is being tested for TCLP Toxicity. If hazardous, the ash is manifested as a hazardous waste. Otherwise, it is disposed in an off-site sanitary landfill.

6. **Amount:** Unknown.

7. **Work Completed:**

   a. During the visual site inspection, the tank was located on bare soil approximately 15 to 30 feet from Chicamuxen Creek's edge.

   b. The 1990 EPA RCRA Corrective Action Permit stated that no further action (NFA) was necessary at the time.

   c. This unit was included in the January 2002 Desktop Audit Decision Document, which was signed by the Navy and the EPA with concurrence from the MDE, on April 23, 2002. The decision reached was this unit would be investigated as part of the Remedial Investigation (RI) for Site 58.

8. **Current Status:** Currently designated as an active range and will not be addressed under the Installation Restoration Program (IRP).

SWMU 17 – BUILDING 2015 – CHEMISTRY LAB ACCUMULATION AREA

(OLD MAP GRID S9)
IRP AOC
Stump Neck Annex SWMU 17
Fact Sheet

1. **Contamination:** Waste enamel, epoxy compound, capicure EH-30, and a resinous chlorinated paraffin (chlorowax 40).

2. **Location:** This unit is located inside Building 2015.

3. **From:** The unit consists of a metal-covered workbench used to store approximately 25 small metal and glass containers of spent chemicals. The containers are labeled and contained in zip-lock plastic bags.

4. **When:** The waste, which was observed during the visual site inspection (VSI), had been stored here since the chemistry lab began operations approximately 20 years ago.

5. **Generated By:** Unknown.

6. **Amount:** Small containers of unknown volume

7. **Work Completed:**

   a. In addition to a VSI according to facility representatives, prior to disposal off-site, the containers were placed in over-pack drums and transferred to the Main Area.

   b. The 1990 EPA RCRA Corrective Action Permit stated that no further action (NFA) was necessary at the time.

   c. This unit was included in the January 2002 Desktop Audit Decision Document, which was signed by the Navy and the EPA with concurrence from the MDE, on April 23, 2002.

8. **Current Status:** The decision reached during the desktop audit was that no action is required to be taken in connection with this unit.

SWMU 18 – WASTE PILE

(OLD MAP GRID F14)
IRP AOC
Stump Neck Annex SWMU 18
Fact Sheet

1. **Contamination:** Unknown.

2. **Location:** This unit is adjacent to the Air Blast Pond (SWMU 6). Facility representatives indicated that this area was originally identified in an aerial photo, which showed a mounded area.

3. **From:** Facility representatives indicated that the mounding seen in an aerial photo may have been excavated material from construction of the Air Blast Pond (SWMU 6).

4. **When:** Unknown.

5. **Generated By:** Construction excavation.

6. **Amount:** Unknown.

7. **Work Completed:**

   a. During the visual site inspection, the unit consisted of a flat, earthen area that was covered with grass. The unit is separated from the Air Blast Pond by a densely wooded area.

   b. The 1990 EPA RCRA Corrective Action Permit stated that no further action (NFA) was necessary at the time.

   c. This unit was included in the January 2002 Desktop Audit Decision Document, which was signed by the Navy and the EPA with concurrence from the MDE, on April 23, 2002.

8. **Current Status:** The decision reached during the desktop audit was that no action is required to be taken in connection with this unit.

SWMU 19 – DISPOSAL AREA NO. 1

(OLD MAP GRID YY21)
IRP AOC
Stump Neck Annex SWMU 19
Fact Sheet

1. **Contamination:** Inert material.

2. **Location:** During the visual site inspection the area was observed to slope downhill from the northwest. A bunker, which functions as an office, occupies a portion of the area. The remaining portion consists of a leveled grassy area rimmed with sparse woods on the eastern side. The woods separate the unit from Chicamuxen Creek (south of Building 2063SN)

3. **From:** This is an unlined earthen area that was later used for various types of training.

4. **When:** Unknown.

5. **Generated By:** Unknown.

6. **Amount:** The unit's size was estimated to be approximately 1.5 acres.

7. **Work Completed:**

   a. The 1990 EPA RCRA Corrective Action Permit stated that no further action (NFA) was necessary at the time.

   b. This unit was included in the January 2002 Desktop Audit Decision Document, which was signed by the Navy and the EPA with concurrence from the MDE, on April 23, 2002.

8. **Current Status:** This site was moved to the Munitions Response Program and will be investigated with Site 64 – Improvised Explosive Devices (MRP Site UXO 004). See fact sheet for Stump Neck Annex Site 64 / SWMU 26 / UXO 4.

SWMU 20 – DISPOSAL AREA NO. 2

(OLD MAP GRID D14)
IRP AOC
Stump Neck Annex SWMU 20
Fact Sheet

1. **Contamination:** Unknown.

2. **Location:** This is a relatively flat earthen area that is bounded on the north by the Potomac River. It is located west of Building 2012SN.

3. **From:** Facility representatives could not provide information about the composition of the inert material disposed here.

4. **When:** Unknown.

5. **Generated By:** Unknown.

6. **Amount:** Unknown.

7. **Work Completed:**

   a. During the visual site inspection, the area was covered with grass and is currently used as a skeet and trap shooting area.

   b. The 1990 EPA RCRA Corrective Action Permit stated that no further action (NFA) was necessary at the time.

   c. This unit was included in the January 2002 Desktop Audit Decision Document, which was signed by the Navy and the EPA with concurrence from the MDE, on April 23, 2002.

   d. The final Preliminary Assessment Report was completed in September 2005.

8. **Current Status:** The decision reached during the desktop audit was that this unit will be investigated as part of SWMU 28 – Old Skeet and Trap Range (MRP Site UXO 015). See fact sheet for SWMU 28 / UXO 15.

SWMU 21 – DRUM STORAGE AREA

(OLD MAP GRID YY21)
IRP AOC
Stump Neck Annex SWMU 21
Fact Sheet

1. **Contamination:** Unknown.

2. **Location:** This unit is a relatively flat earthen area where several drums of unknown materials and origin were stored on a short-term basis. (West of Building 2012SN)

3. **From:** The drums were noted in an aerial photo, and facility representatives could provide no further information.

4. **When:** Unknown.

5. **Generated By:** Unknown.

6. **Amount:** Unknown.

7. **Work Completed:**

   a. At the time of the visual site inspection, no drums were being stored here.

   b. The 1990 EPA RCRA Corrective Action Permit stated that no further action (NFA) was necessary at the time.

   c. This unit was included in the January 2002 Desktop Audit Decision Document, which was signed by the Navy and the EPA with concurrence from the MDE, on April 23, 2002.

8. **Current Status:** The decision reached during the desktop audit was that no action is required to be taken in connection with this unit.

SWMU 28 / UXO 15 – OLD SKEET AND TRAP RANGE

IRP AOC
Stump Neck Annex SWMU 28 / MRP Site UXO 15
Fact Sheet

1. **Contamination:** This area lies on what was originally identified as SWMU 20, Disposal Area 2, in the RCRA corrective action permit. The permit states that, "During the visual site inspection, the area was covered with grass and is currently used as a skeet and trap shooting area." In addition, the permit states, "EPA has determined that no further action (NFA) is necessary at this time." However, since the draft RFA was written, use of the skeet range has been discontinued. The skeet range was used mainly for recreational purposes. Clay pigeons were used as targets. Therefore, lead shots remain on the ground at the skeet range and in the Potomac River.

2. **Location:** West of Building 2012SN.

3. **From:** Unknown.

4. **When:** Operations began more than 25 years ago and ended in June 1991. The range is currently inactive.

5. **Generated By:** Unknown.

6. **Amount:** Unknown.

7. **Work Completed:**

   a. This unit was included in the January 2002 Desktop Audit Decision Document, which was signed by the Navy and the EPA with concurrence from the MDE, on April 23, 2002. The decision reached was that the unit should be subjected to the site screening process.

   b. A final Preliminary Assessment (PA) Report was completed in September 2005.

   c. The site was designated as Munitions Response Program (MRP) Site UXO 015.

   d. A Site Investigation (SI) Report was finalized for the site in September 2010. The report recommended a Phase 2 SI to fill data gaps.

   e. A Work Plan for the Phase 2 SI was completed in June 2011. The Phase 2 SI field work was completed in October 2011.

   f. The Phase 2 SI Report was finalized in May 2012. Additional groundwater investigation was recommended for UXO 015.

   g. The Engineering Evaluation and Cost Analysis (EE/CA) for a soil non-time-critical removal action (NTCRA) was finalized in June 2012.

8. **Current Status:** A draft Action Memorandum was submitted in June 2012, but is on hold. A UFP-SAP Work Plan for further groundwater investigation was completed in August 2015. Fieldwork is planned for fall 2015. Potential soil removal action work will be completed when funding becomes available.

SWMU 29 / UXO 17 – SMALL ARMS RANGE (PISTOL RANGE)

(OLD MAP GRID V7)
IRP AOC
Stump Neck Annex SWMU 29 / MRP Site UXO 17
Fact Sheet

1. **Contamination:** The facility Security Department used this site for training for approximately 7 years, ending in August 1991. Rounds were fired into the side of a hill. The side of the hill contains lead shots.

2. **Location:** Near Building 2070SN.

3. **From:** Unknown.

4. **When:** Approximately 7 years, ending in August 1991

5. **Generated By:** Unknown.

6. **Amount:** Unknown.

7. **Work Completed:**

   a. This unit was included in the January 2002 Desktop Audit Decision Document, which was signed by the Navy and the EPA with concurrence from the MDE, on April 23, 2002. The decision reached was that, due to lack of information available, the unit should be retained as an area of concern pending additional investigation.

   b. The final Preliminary Assessment (PA) Report was completed in September 2005.

   c. The site was designated as Munitions Response Program (MRP) Site UXO 017.

   d. A Site Investigation (SI) Report was finalized for the site in September 2010. The report recommended a Phase 2 SI to fill data gaps.

   e. A Work Plan for the Phase 2 SI was completed in June 2011. The Phase 2 SI field work was completed in October 2011.

   f. The Phase 2 SI Report was finalized in May 2012. No unacceptable risks were identified for groundwater at UXO 017. Therefore, no action is recommended for groundwater at UXO 017.

   g. The Engineering Evaluation and Cost Analysis (EE/CA) for a soil non-time-critical removal action (NTCRA) was finalized in June 2012.

8. **Current Status:** A draft Action Memorandum was submitted in June 2012, but is on hold. Removal action work for soil will be completed when funding becomes available.

SWMU 30 – BUILDING 2015 DRY WELL

IRP AOC
Stump Neck Annex SWMU 30
Fact Sheet

1. **Contamination:** This site consists of a dry well that is connected to a laboratory located in Building 2015.

2. **Location:** Industrial Wastewater Outfall 64 (IW 64), Building 2015.

3. **From:** Spent chemical reagents from the laboratory were discarded by pouring them down the drain. Currently, only wash water from a hand sink is discharged to the dry well.

4. **When:** Approximately 10 years.

5. **Generated By:** The overflow from the dry well enters permitted NPDES Outfall IW 64.

6. **Amount:** Unknown.

7. **Work Completed:**

   a. This unit was included in the January 2002 Desktop Audit Decision Document, which was signed by the Navy and the EPA with concurrence from the MDE, on April 23, 2002. The decision reached was that, due to lack of information available, the unit should be retained as an area of concern pending additional investigation.

   b. A Site Screening Process (SSP) Report was submitted in September 2006. The report recommended no action.

8. **Current Status:** A No Action Decision Document was signed in September 2006.

UXO 14 – MARINE RIFLE RANGE

MRP Site UXO 14
Fact Sheet

1. **Contamination:** Lead and other munitions constituents such as antimony, arsenic, copper, nickel, and lead styphnate/lead azide.

2. **Location:** South of Archer Avenue between the Causeway and Building 2195.

3. **From:** Small arms training.

4. **When:** 1911 to 1918.

5. **Generated By:** Practice range firing of small arms.

6. **Amount:** Unknown.

7. **Work Completed:**

   a. A final Preliminary Assessment (PA) Report was completed in September 2005.

   b. The site was designated as MRP Site UXO 014.

   b. A Site Investigation (SI) Report was finalized for the site in September 2010. The report recommended a Phase 2 SI to fill data gaps.

   c A Work Plan for the Phase 2 SI was completed in June 2011. The Phase 2 SI field work was completed in October 2011.

   d. The Phase 2 SI Report was finalized in May 2012. No unacceptable risks were identified for groundwater at UXO 014. Therefore, no action is recommended for groundwater at UXO 014.

   e. The Engineering Evaluation and Cost Analysis (EE/CA) for a soil non-time-critical removal action (NTCRA) was finalized in June 2012.

8. **Current Status:** A draft Action Memorandum was submitted in June 2012, but is on hold. Removal action work for soil will be completed when funding becomes available.

UXO 16 – RUM POINT SKEET RANGE

MRP Site UXO 16
Fact Sheet

1. **Contamination:** Lead, antimony, arsenic, copper, zinc, and polycyclic aromatic hydrocarbons (PAHs).

2. **Location:** The northeast section of the Stump Neck Annex, directly north of Skeet Range Way.

3. **From:** Small arms (shotgun) firing.

4. **When:** 1991 to 2001.

5. **Generated By:** Recreational skeet range use by the Potomac River Gun Club.

6. **Amount:** Unknown.

7. **Work Completed:**

   a. A final Preliminary Assessment (PA) Report was completed in September 2005.

   b. The site was designated as Munitions Response Program (MRP) Site UXO 016.

   c. A Site Investigation (SI) Report was finalized for the site in September 2010. The report recommended a Phase 2 SI to fill data gaps.

   d. A Work Plan for the Phase 2 SI was completed in June 2011. The Phase 2 SI field work was completed in October 2011.

   e. The Phase 2 SI Report was finalized in May 2012. No unacceptable risks were identified for groundwater at UXO 016. Therefore, no action is recommended for groundwater at UXO 016.

   f. The Engineering Evaluation and Cost Analysis (EE/CA) for a soil non-time-critical removal action (NTCRA) was finalized in June 2012.

8. **Current Status:** A draft Action Memorandum was submitted in June 2012, but is on hold. Removal action work for soil will be completed when funding becomes available.

UXO 18 – BATTLE RANGE FIRING AREA

MRP Site UXO 18
Fact Sheet

1. Contamination: Naval ordnance constituents- explosives and metals.

2. Location: The north-central section of Stump Neck Annex extending from the Potomac River to the north bluff along the shoreline of the Mattawoman Creek.

3. From: Testing of projectiles through battle range firing.

4. When: 1910 - unknown.

5. Generated By: Battle range firing using 3", 5", 8", 12", and 14" AP shells and high powered firing using pasteboard or similar targets. (Battle Range area is 340 acres in size; approximately 184 acres are overlapped by the Water Impact Area.)

6. Amount: Unknown.

7. Work Completed:

a. The site was designated as Munitions Response Site (MRP) Site UXO 018 and was included in the Water Area Munitions Study (WAMS) which was completed in February 2005.

b. A Site Inspection (SI) was completed in September 2010 and recommended no action for munitions and explosives of concern (MEC) and munitions constituents (MC).

8. Current Status: Although the SI recommended no action for the site, it recommended that the existing Danger Zone on the National Oceanic and Atmospheric Administration (NOAA) maps be expanded to include the potential impact area from UXO 033, updating the current site use, and restricting intrusive activities. This site may be investigated further in the future.

UXO 21 – TEST AREA 1

MRP Site UXO 21
Fact Sheet

1. **Contamination:** TNT and TNT breakdown products.

2. **Location:** Center of the Stump Neck Annex peninsula.

3. **From:** Experiments, testing, and training that utilized small charges.

4. **When:** 1950s to present.

5. **Generated By:** During the 1960s and 1970s, Advanced, Access, and Disablement (AA&D) trainings (such as booby traps and wires); in the 1980s, IED and IND training. Training items were inert but small charges of TNT were set off for total consumption.

6. **Amount:** Unknown.

7. **Work Completed:**

   a. A Preliminary Assessment (PA) Report was completed in September 2005.

   b. A Site Inspection (SI) was completed in September 2010, and recommended a Remedial Investigation (RI) for munitions and explosives of concern (MEC), but no action for munitions constituents (MC).

8. **Current Status:** The site was designated as Munitions Response Program (MRP) Site UXO 021. A UFP-SAP Work Plan and ESS were finalized in August 2015. Remedial Investigation (RI) fieldwork is planned for fall 2015.

UXO 22 – TEST AREA 2

UXO 22
Fact Sheet

1. **Contamination:** Constituents from ordnance testing/training.

2. **Location:** The southern central portion of Stump Neck Annex off an unnamed dirt road extending from the southern side of Old Range Road.

3. **From:** Non-explosive magnetic test range.

4. **When:** 1978 to present.

5. **Generated By:** The area is used as a non-explosive magnetic test range; no evidence confirming the use of explosives testing/training was discovered during the Preliminary Assessment (PA).

6. **Amount:** Unknown.

7. **Work Completed:** A Preliminary Assessment (PA) Report was completed in September 2005.

8. **Current Status:** The site was designated as Munitions Response Program (MRP) Site UXO 022. The IHIRT signed a Decision Document in February 2011 stating no action was necessary at this site.

UXO 23 – TORPEDO CASING DISPOSAL AREA

MRP Site UXO 23
Fact Sheet

1. **Contamination:** Metals and potential munitions constituents (MC) from residue remaining on the inside of torpedo casings.

2. **Location:** Center portion of the Stump Neck Annex north of Archer Avenue and partially within a designated wildlife area.

3. **From:** Disposal of torpedo casings.

4. **When:** 1950s.

5. **Generated By:** Disposal of torpedo casings that may have originated from training at the Explosive Ordnance Disposal (EOD) school or from use during WWII.

6. **Amount:** Unknown.

7. **Work Completed:**

   a. A Preliminary Assessment (PA) Report was completed in September 2005.

   b. A Site Inspection (SI) was completed in September 2010, recommending a Remedial Investigation (RI) for munitions and explosives of concern (MEC), but no action for munitions constituents (MC).

8. **Current Status:** The site was designated as Munitions Response Program (MRP) Site UXO 023. The RI for MEC will begin when funding becomes available.

UXO 25 – ROACH ROAD RIFLE RANGE

MRP Site UXO 25
Fact Sheet

1. **Contamination:** Lead.

2. **Location:** Central portion of Stump Neck Annex on the west side of Roach Road.

3. **From:** Small arms training.

4. **When:** 1963 to 1986.

5. **Generated By:** Small arms training with pistols and rifles.

6. **Amount:** Unknown.

7. **Work Completed:**

   a. A final Preliminary Assessment (PA) Report was completed in September 2005.

   b. The site was designated as Munitions Response Program (MRP) Site UXO 025

   c. A Site Investigation (SI) Report was finalized for the site in September 2010. The report recommended a Phase 2 SI to fill data gaps.

   e. A Work Plan for the Phase 2 SI was completed in June 2011. The Phase 2 SI field work was completed in October 2011.

   f. The Phase 2 SI Report was finalized in May 2012. Additional investigation was recommended for groundwater at UXO 025.

   g. The Engineering Evaluation and Cost Analysis (EE/CA) for a soil non-time-critical removal action (NTCRA) was finalized in June 2012.

8. **Current Status:** A draft Action Memorandum was submitted in June 2012, but is on hold. A UFP-SAP Work Plan for further groundwater investigation was completed in August 2015 and fieldwork is planned for fall 2015. Potential soil removal action work will be completed when funding becomes available.

UXO 26 – THE VALLEY IMPACT AREA

MRP Site UXO 26
Fact Sheet

1. **Contamination:** Potential munitions constituents including explosive D, black powder, TNT, magnesium, NH powder, CTNT, various propellants, and metals.

2. **Location:** The majority of the western portion of the Stump Neck Annex.

3. **From:** Used as an impact area from The Valley on Indian Head Main Installation.

4. **When:** 1891 to 1921.

5. **Generated By:** Firing of long-range projectiles from The Valley to the impact area.

6. **Amount:** Unknown.

7. **Work Completed:**

   a. A final Preliminary Assessment (PA) Report was completed in September 2005.

   b. A Site Inspection (SI) was completed in September 2010, and recommended a Remedial Investigation (RI) for munitions and explosives of concern (MEC), but no action for munitions constituents (MC).

8. **Current Status:** The site was designated as Munitions Response Program (MRP) Site UXO 026. The RI for MEC will begin when funding becomes available.

UXO 27 – SONAR TRAINING AREA

MRP Site UXO 27
Fact Sheet

1. **Contamination:** TNT, explosives residuals, and metals.

2. **Location:** In the Potomac River along the north-central portion of Stump Neck Annex, north of Archer Ave. in the vicinity of Building 2174.

3. **From:** Underwater sonar training exercises.

4. **When:** 1980s to mid-1990s.

5. **Generated By:** Use of inert ordnance items (sea mines, torpedoes, and depth charges) for training. The site may also contain munitions associated with the Water Impact Area, which encompasses the Sonar Training Area.

6. **Amount:** Unknown.

7. **Work Completed:**

   a. The site was designated as Munitions Response Program (MRP) Site UXO 027. It was included in the Water Area Munitions Study (WAMS), which was completed in February 2005 and recommended a Site Inspection for munitions and explosives of concern (MEC), but no action for munitions constituents (MC).

   b. A Site Inspection (SI) was completed in September 2010, and recommended institutional controls (ICs).

8. **Current Status:** The SI Report recommended that the existing Danger Zone on the National Oceanic and Atmospheric Administration (NOAA) maps be expanded to include the potential impact area from UXO 033, updating the current site use, and restricting intrusive activities. The site may be investigated further in the future.

UXO 28 – EOD SCHOOL DEMO AREA

MRP Site UXO 28
Fact Sheet

1. **Contamination:** Potential munitions constituents include metals, TNT, explosive residuals, and Tetryl.

2. **Location:** On the Stump Neck Annex, within the boundaries of the Marine Rifle Range and the Torpedo Burial Site.

3. **From:** Use as a demolition area.

4. **When:** 1944 to 1949.

5. **Generated By:** Explosive Ordnance Disposal (EOD) school use to detonate live explosives.

6. **Amount:** Unknown.

7. **Work Completed:**

   a. A final Preliminary Assessment (PA) Report was completed in September 2005.

   b. A Site Inspection (SI) was completed in September 2010, and recommended a Remedial Investigation (RI) for munitions and explosives of concern (MEC), but no action for munitions constituents (MC).

8. **Current Status:** The site was designated as Munitions Response Program (MRP) Site UXO 028. The RI for MEC will begin when funding becomes available.

UXO 31 – POPE'S CREEK

MRP Site UXO 31
Fact Sheet

1. **Contamination:** Potential TNT.

2. **Location:** Southeast of Indian Head, off the installation, near Pope's Creek, Maryland. Lies approximately 1 to 2 miles north of the Potomac River Bridge and extends west from the eastern shoreline of the Potomac River.

3. **From:** Underwater testing of demolition charges and/or explosive material.

4. **When:** 1947.

5. **Generated By:** Underwater explosions of demolition charges and/or explosive material.

6. **Amount:** Unknown.

7. **Work Completed**:

   a. The site was designated as Munitions Response Program (MRP) Site UXO 031 and was included in the Water Area Munitions Study (WAMS) which was completed in February 2005.

   b. A Site Inspection (SI) was completed in September 2010, and recommended no action for munitions and explosives of concern (MEC) and munitions constituents (MC).

8. **Current Status:** The site was designated as MRP Site UXO 031. Although the SI recommended no action for the site, it recommended that the existing Danger Zone on the National Oceanic and Atmospheric Administration (NOAA) maps be expanded to include the potential impact area from UXO 033, updating the current site use, and restricting intrusive activities. UXO 031 may be investigated further in the future.

3.0 SITE LOCATION SUMMARY

The locations of all the sites and AOCs identified in the previous sections of this Site Management Plan are illustrated in Figures 3-1 and 3-2. Figure 3-1 shows the locations of the NSFIH Main Area sites and AOCs, while Figure 3-2 shows the locations of the NSFIH Stump Neck Annex sites and AOCs.

4.0 SCHEDULES

Table 4-1 provides the schedule for the investigation and reporting of all the sites and AOCs identified in the preceding sections of this Site Management Plan.

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TABLE 1-1
INSTALLATION RESTORATION PROGRAM SITES AND SWMUs
MAIN AREA AND STUMP NECK ANNEX
NSFIH, INDIAN HEAD, MARYLAND

IR Site ID	SWMU or AOC ID	MRP UXO ID	Name	Main Area (MA) / Stump Neck (SN)	Relative Risk	FFA Group	Status	Comments
INSTALLATION RESTORATION (IR) SITES								
1			Thorium Spill	MA	Low	SSA	IRA	
2			Waste Crank Case Oil Applied to Torrence Road	MA	Low	SSA	NFA	
3			Nitroglycerin Explosion, Nitration Building Area	MA	Low	SSA	NFA	
4			Lloyd Road Oil Spill Sites	MA	Low	SSA	NFA	
5			X-Ray Building 731	MA	Medium	SSA	NFA	
6			Building 1349, Hypo Spill	MA	High	RI/FS	NFA	IRA resulted in NFA ROD
7			Building 682, HMX Spill	MA	Medium	SSA	NFA	
8			Building 766, Mercury Deposits	MA	High	SSA	NFA	IRA resulted in NFA DD
9			Patterson Avenue, Oil Spill	MA	Low	SSA	NFA	
10		9	Single-base Propellant Grains Spill	MA	Low	SSA	RI/FS	Included in MRP
11			Caffee Road Landfill	MA	High	RI/FS	RC / LTM	
12			Town Gut Landfill	MA	High	RI/FS	RC / LTM	
13			Paint Solvents Disposal Ground	MA	High	RI/FS	NFA	
14			Waste Acid Disposal Pit	MA	High	SSA	NFA	IC's - Lab Area
15			Mercury Deposits in Manhole, Fluorine Lab	MA	High	RI/FS	NFA	IC's - Lab Area
16			Laboratory Chemical Disposal	MA	High	RI/FS	NFA	IC's - Lab Area
17			Disposed Metal Parts Along Shoreline	MA	High	RI/FS	RA-O	
18			Hog Island	MA	Low	SSA	NFA	
19			Catch Basins at Chip Collection Houses	MA	Low	SSA	NFA	IRA resulted in NFA DD
20			Single-base Powder Facilities	MA	Low	SSA	NFA	
21			Bronson Road Landfill	MA	High	RI/FS	RC / LTM	
22		6	NG Slums Burning Site	MA	Low	SSA	RI/FS	Included in MRP
23			Hydraulic Oil Spill Discharges From Extrusion Plant	MA	Low	SSA	NFA	
24			Abandoned Drain Lines	MA	Medium	SSA	NFA	
25			Hypo Discharge X-Ray Building No. 2	MA	High	RI/FS	NFA	
26			Thermal Destructor 2	MA	Low	SSA	NFA	
27			Thermal Destructor 1	MA	Low	SSA	NFA	IRA resulted in NFA DD
28		8	Original Burning Ground	MA	High Medium	SSA	RC/LTM	NFA for soil. ICs and LTM for GW
29		11	The Valley	MA	Low	SSA	RI/FS	Included in MRP
30	22	10	Stump Neck Impact Area	SN	NE	SSA	RI/FS	Included in MRP
31	23	7	Old Demolition Range	SN	NE	SSA	NFA	Active Range
32	11		Suspected Tool Burial Site	SN	NE	SSA	NFA	
33	7		Scrap Metal Pit	SN	NE	SSA	NFA	
34	8		Tool Burial Site	SN	NE	SSA	NFA	
35	9	12	Torpedo Burial Site	SN	NE	SSA	RI/FS	Included in MRP
36	10		Closed Landfill	SN	NE	SSA	RC / LTM	
37	24	3	Causeway	SN	NE	SSA	NFA	No evidence of waste
38	1		Rum Point Landfill	SN	Medium	SSA	RA	RA for soil/waste removal and GW LTM.
39			Silver Release to Sediments	MA	High	RI/FS	NFA	
40			Palladium Catalyst in Sediments	MA	Low	RI/FS	NFA	
41		32	Scrap Yard	MA	High	RI/FS	NFA	Included in MRP. ICs for soil. GW re-assigned as IR Site 70.
42			Olsen Road Landfill	MA	High	RI/FS	RC / LTM	
43			Toluene Disposal Site	MA	Low	RI/FS	RI/FS	
44			Soak Out Area	MA	Medium	RI/FS	NFA	
45			Abandoned Drums	MA	Medium	RI/FS	NFA	
46			Cadmium Sandblast Grit	MA	Low	RI/FS	NFA	
47			Mercuric Nitrate Disposal Area	MA	High	RI/FS	RA-O	
48			Nitroglycerin Plant Disposal Area	MA	Low	RI/FS	NFA	
49			Chemical Disposal Pit	MA	High	RI/FS	NFA	IC's - Lab Area
50			Building 103, Crawl Space	MA	High	RI/FS	NFA	IC's - Lab Area
51			Building 101, Dry Well	MA	NE		NFA	
52			Building 102, Dry Well	MA	NE		NFA	
53			Mercury Contamination of the Sewage System	MA	High	RI/FS	NFA	IC's - Lab Area
54			Building 101	MA	High	RI/FS	NFA	IC's - Lab Area
55			Building 102	MA	High	RI/FS	NFA	IC's - Lab Area
56			IW87 - Lead Contamination	MA	Low	RI/FS	NFA	
57			TCE Building 292 Area	MA	High	RI/FS	RA-O	
58	2		Range 3 Burn Point	SN	High	SSA	NFA	Active Range
59	3		Chicamuxen Creek's Edge Site A	SN	High	SSA	NFA	Active Range
60	4		Chicamuxen Creek's Edge Site B	SN	Medium	SSA	NFA	
61	5		Range 6	SN	Medium	SSA	NFA	Active Range
62	6	1	Air Blast Pond	SN	Medium	SSA	RI/FS	Included in MRP
63	25	2	Area 8	SN	Medium	SSA	RI/FS	Included in MRP
64	26	4	IED (+SN SWMU 19)	SN	Medium	SSA	RI/FS	Included in MRP

TABLE 1-1
INSTALLATION RESTORATION PROGRAM SITES AND SWMUs
MAIN AREA AND STUMP NECK ANNEX
NSFIH, INDIAN HEAD, MARYLAND

IR Site ID	SWMU or AOC ID	MRP UXO ID	Name	Main Area (MA) / Stump Neck (SN)	Relative Risk	FFA Group	Status	Comments
65	27	5	IOD	SN	Medium	SSA	RI/FS	Included in MRP
66			Turkey Run Disposal Area	MA	Medium	SSA	RI/FS	
67			Hog-Out Facility	MA	Medium	RI/FS	RI/FS	
69			Building 1018 - Oxidizer Process Building	MA	Medium	SSA	RI/FS	
70			Groundwater Contamination Along Water Works Way	MA	Medium	RI/FS	RI/FS	
AOCs / SWMUs								
	6		Used Battery Accumulation Area (Bldg. 766)	MA	NE	AOC	NFA	
	12		Waste Oil Storage Site	SN	NE	AOC	NFA	
	13		Pink Water Treatment Tank	SN	NE	AOC	RCRA	
	14		Photographic Lab Septic Tank System	SN	NE	AOC	RI/FS	SWMU 14 now an IR Site
	15		Spent Photographic Solution Storage	SN	NE	AOC	NFA	
	16		Thermal Treatment Tank	SN	NE	AOC	NFA	Active Range
	17		Bldg. 2015 – Chem Lab Accumulation Area	SN	NE	AOC	NFA	
	18		Waste Pile	SN	NE	AOC	NFA	
	19	4	Disposal Area #1	SN	NE	AOC	RI/FS	Included in MRP with Site 64
	20	20	Safety Thermal Treatment Point	MA	Medium	AOC	RI/FS	Re-assigned as UXO 20
	20	15	Disposal Area #2	SN	NE	AOC	RI/FS	Investigate with Stump Neck SWMU 28, Included in MRP
	21		Caffee Road Decontamination Burn Point	MA	NE	AOC	LTM	Investigate with Site 11
	21		Drum Storage Area	SN	NE	AOC	NFA	
	27		Waste Oil Storage Area (Goddard Power Plant)	MA	Low	AOC	NFA	
	28	15	Old Skeet and Trap Range	SN	NE	AOC	RI/FS	Included in MRP
	29	17	Small Arms Range (Pistol Range)	SN	NE	AOC	RI/FS	Included in MRP
	30		Bldg. 2015 Dry Well	SN	NE	AOC	NFA	SWMU 30
	38		Caffee Road Waste Oil Storage Area	MA	Low	AOC	LTM	Investigate with Site 11
	69		Temp Accumulation Dumpster for Explosive Scrap	MA	Low	AOC	NFA	
	70		Temp Accum Areas for Drummed Explosive Scrap	MA	Low	AOC	NFA	
	72		Oil/Water Separators	MA	Low	AOC	NFA	
	74		Unlined Overland Drainage Ditches	MA	Low	AOC	NFA	
	4,5		Underground Storage Tanks (Bldg. 290 and 525)	MA	NE	AOC	NFA	
	40-46		Wastewater Collection/Treatment Tanks (Moser Plant)	MA	Low	AOC	NFA	
	47-51		Spent Acid Storage/Treatment Tanks (Moser Plant)	MA	Low	AOC	NFA	
	64-66		Waste Water Storage Tanks (Bldg. 1596)	MA	Low	AOC	NFA	
	AOC G		Sand Blasting Sand Storage Area	MA	Low	AOC	NFA	
	AOC H		Drum at Fuel Storage Area	MA	Low	AOC	NFA	
	AOC 31		Building 259 - Old Storehouse/Detonator Production Facility	MA	Low	SSA	SSI	
ADDITIONAL MRP SITES								
		13	FDR Skeet Range	MA	Low	NA	RI/FS	
		14	Marine Rifle Range	SN	Low	NA	RI/FS	
		16	Rum Point Skeet Range	SN	Low	NA	RI/FS	
		18	Battle Range Firing	SN	NE	NA	RI/FS	Water Area Munitions Site
		19	Igniter Area	MA	NE	NA	RI/FS	Water Area Munitions Site
		21	Test Area 1	SN	Low	NA	RI/FS	
		22	Test Area 2	SN	Low	NA	NFA	
		23	Torpedo Casing Disposal Area	SN	Low	NA	RI/FS	
		25	Roach Road Rifle Range	SN	Low	NA	RI/FS	
		26	The Valley Impact Area	SN	Medium	NA	RI/FS	
		27	Sonar Training Area	SN	NE	NA	RI/FS	Water Area Munitions Site
		28	EOD School Demo Area	SN	Medium	NA	RI/FS	
		29	Southwestern Pistol Range	MA	Low	NA	NFA	
		30	Gate 3 Burning Ground	MA	Medium	NA	RI/FS	
		31	Pope's Creek	--	NE	NA	RI/FS	Water Area Munitions Site
		33	Water Impact Area	MA	NE	NA	RI/FS	Water Area Munitions Site

AOC - Area of Concern
IC - Institutional Control
ID - Identification
IR - Installation Restoration [Program]
IRA - Interim Removal Action (or Removal Action)
LTM - Long Term Monitoring
MRP - Munitions Response Program
NA - Not Applicable
NE - Not Evaluated
NFA - No Further Action
RA - Remedial Action
RA-O - Remedial Action-Operation
RCRA - Resource Conversation and Recovery Act
RCRA - Response Complete
RD - Remedial Design
RI/FS - Remedial Investigation/Feasibility Study
SSA - Site Screening Assessment
SSI - Site Screening Investigation
SSP - Site Screening Process
SWMU - Solid Waste Management Unit

TABLE 1-2
SUMMARY OF DESKTOP AUDIT FOR AREAs OF CONCERN (AOCs)
MAIN AREA
NSFIH, INDIAN HEAD, MARYLAND

AOC	NAME	DECISION
Main Area SWMUs 4 and 5	Underground Storage Tanks (Buildings 290/525)	No action required
Main Area SWMU 6	Used Battery Accumulation Area (Building 290)	No action required
Main Area SWMU 27	Waste Oil Storage Area (Goddard Power)	No action required
Main Area SWMU 38	Caffee Road Waste Oil Storage Area	Investigate with Site 11 Remedial Investigation
Main Area SWMUs 40-46	Wastewater Collection/Treatment Tanks	No action required
Main Area SWMUs 47-51	Spent Acid Storage/Treatment Tanks	No action required
Main Area SWMUs 64-66	Wastewater Storage Tanks (Building 1596)	No action required
Main Area SWMU 69	Temporary Dumpster for Explosive Scrap	No action required
Main Area SWMU 70	Temporary Areas for Drummed Explosive Scrap	No action required
Main Area SWMU 72	Oil/Water Separators	No action required
Main Area SWMU 74 (1)	Unlined Overland Drainage Ditches	Retain as an AOC pending further investigation
Main Area AOC G	Sand-Blasting Sand Storage Area	No action required
Main Area AOC H	Drum at Fuel Storage Area	No action required
Main Area SWMU 20 (2)	Safety Thermal Treatment Point	Conduct a Remedial Investigation
Main Area SWMU 21	Caffee Road Decontamination Burn Point	Investigate with Site 11 Remedial Investigation

Notes
AOC – Area of Concern
SWMU – Solid Waste Management Unit
1. After the initial desktop audit was finished, the Indian Head Installation Restoration Team (IHIRT) signed a concurrence letter for no further action at this AOC.
2. This SWMU has been moved to the Munitions Response Program (MRP).

TABLE 1-3
SUMMARY OF DESKTOP AUDIT FOR AREAs OF CONCERN (AOCs)
STUMP NECK ANNEX
NSFIH, INDIAN HEAD, MARYLAND

AOC	NAME	DECISION
Stump Neck SWMU 12	Waste Oil Storage Site	No action required
Stump Neck SWMU 13	Pink Water Treatment Tank	Manage under the RCRA program
Stump Neck SWMU 14 (1)	Photographic Lab Septic System	Retain as an AOC pending further investigation
Stump Neck SWMU 15	Spent Photographic Solution Storage	No action required
Stump Neck SWMU 16 (2)	Thermal Treatment Tank	Investigate with Site 58 Remedial Investigation
Stump Neck SWMU 17	Building 2015 – Chemical Lab Accumulation Area	No action required
Stump Neck SWMU 18	Waste Pile	No action required
Stump Neck SWMU 19 (3)	Disposal Area No. 1	Investigate with Site 64 Remedial Investigation
Stump Neck SWMU 20 (3)	Disposal Area No. 2	Investigate with Stump Neck SWMU 28
Stump Neck SWMU 21	Drum Storage Area	No action required
Stump Neck SWMU 28 (3)	Old Skeet and Trap Range	Investigate with the Site Screening Process
Stump Neck SWMU 29 (3)	Small Arms Range (Pistol Range)	Retain as an AOC pending further investigation
Stump Neck SWMU 30 (4)	Building 2015 Dry Well	Retain as an AOC pending further investigation

Notes

AOC – Area of Concern

SWMU – Solid Waste Management Unit

RCRA – Resource Conservation and Recovery Act

1. Currently undergoing a Remedial Investigation.
2. Designated as an active range and will not be addressed under the Installation Restoration (IR) program.
3. SWMUs that have been transferred to the Munitions Response Program (MRP).
4. No Further Action Required.

TABLE 4-1
SCHEDULE (FY15-FY16)
NSFIH, INDIAN HEAD, MARYLAND

As of 8/20/2015 for 4th Quarter FY15

SITE	GOAL/MILESTONE	DUR[1]	PLANNED DATE	REVISED DATE	ACTUAL DATE	COMMENTS
All Sites						
	Update Site Management Plan FY15-16 (Draft)		Jun-2015		Jun-2015	
	Update Site Management Plan FY15-16 (Final)	90	Sep-2015			
	Five-Year Review (Pre-Draft)		May-2017			
	Five-Year Review (Draft)	30	Jun-2017			
	Five-Year Review (Final)	120	Oct-2017			Navy sign-by date 9/27/17; EPA sign-by date 9/27/17
	Update Master Project Plans (Draft)		TBD			Note: Current Master UFP-SAP was finalized in May 2009.
	Update Master Project Plans (Final)		TBD			
	Update Community Relations Plan (Draft)		TBD			
	Update Community Relations Plan (Final)	150	TBD			Last updated- May 2014
	Update Administrative Record CDs		TBD			
	Preliminary Closeout Report		Sep-2025			Updated per EPA SEMS date
Site 1	**OU 18 - Thorium Spill**					Major contaminants: Thorium in soil; Exit strategy: removal; Last milestone: Final Work Plan-1/13; NORM RC Date: 9/30/16
	Complete Remedial Action					
	Complete Additional Soil Characterization		Dec-2014	Jan-2015	Mar-2015	
	Complete Interim Removal Action-RIP	30	Dec-2015			Date is dependent upon availability of funding
	Complete Closeout Document					
	Complete Draft Closeout Report		Jan-2016			
	Complete Final Closeout Report	60	Feb-2016			
	Complete Draft Decision Document		Mar-2016			Will be prepared after Closeout Report
	Complete Final Decision Document	30	May-2016			
	Response Complete		May-2016			
Site 11	**OU 12 - Caffee Road Landfill**					Major contaminants: potential metals in GW; Exit strategy: LTM, Last milestone: Final RACR-6/14; NORM RC Date: 5/30/12
	Long-Term Monitoring					
	Complete LTM Events		Sep-2015			Site undergoing biannual LTM for groundwater
Site 12	**OU 02 - Town Gut Landfill**					Major contaminants: Metals in GW; Exit strategy: LTM; Last milestone: Completed sampling event #29 in 7/13; NORM RC Date: 1/6/04
	Long-Term Monitoring					
	Complete LTM Events		Sep-2015			Site undergoing LTM for groundwater and landfill inspections every 9 months
Sites (14, 15, 16, 49, 50, 53, 54, 55)	**OU 9 - Lab Area**					Major contaminants: Mercury in soil and sediment; Exit strategy: removal; Last milestone: Final RACR- 9/14; NORM RC Date: 6/16/14
	Five-Year Review (FY17)					ICs in place; site to be included in next Five-Year Review
SWMU 14	**OU 27 - Photographic Lab Septic Tank System**					Major contaminants: Cobalt in GW; Proabale exit strategy: TBD; Last milestone: RI Work Plan- 6/12; NORM RC Date: 10/12/27
	SWMU 14 Remedial Investigation/Feasibility Study					Pilot Study newly added to schedule. Contract was awarded in April 2014. Pre-draft version of the SAP was submitted to the Navy chemist in Sept 2014. Hard copy with HASP was submitted to FEAD for review.
	Complete Draft Pilot Study Work Plan		Nov-2014		Nov-2014	
	Complete Final Pilot Study Work Plan	60	Mar-2015		Mar-2015	
	Complete Pilot Study Fieldwork		Jul-2016			Complete well installation, baseline sampling, injection in 5 weeks. Complete 9 months of monthly GW sampling
	Complete Draft Pilot Study Tech Memo	120	Dec-2016			
	Complete Final Pilot Study Tech Memo	60	Feb-2017			
	Complete Draft FS	60	Mar-2017			
	Complete Final FS	90	Jul-2017			
	Complete Proposed Plan					
	Complete Draft PP		Apr-2017			
	Complete Final PP	60	Oct-2017			
	Complete RoD					
	Complete Pre-Draft RoD		Dec-2017			
	Complete Draft RoD	30	Mar-2018			
	Complete Final RoD	90	Jun-2018			
	RoD Signed	30	TBD			
	Complete Remedial Design					
	Complete 35% RD		Jul-2018			
	Complete 100% RD	60	Sep-2018			
	Complete Final RD	90	Dec-2018			
	Complete Remedial Action					
	Award Remedial Action		Dec-2018			Award date based on availability of funding
	Complete Draft RA Work Plan	30	Jan-2019			
	Complete Final RA Work Plan	60	Mar-2019			
	Start Construction	30	Apr-2019			
	Complete Construction - RIP	60	Jun-2019			
	Complete Closeout Report	30	Jul-2019			
	Complete RACR					
	Complete Final RACR		TBD			
	Complete LUC RD					
	Complete Final LUC RD		TBD			
	Complete LTMP					Start of actual monitoring depends on the completion of the remedial action
	Complete Final LTMP		TBD			
Site 17	**OU 14 - Disposed Metal Parts Along Shoreline**					Major contaminants: TCE in GW; Exit strategy: Soil mixing, LTM, MNA, Last milestone: Final Soil Mixing Completion Report- 6/13; NORM RC Date: 9/30/21
	Complete Remedial Action					
	Final Closeout Report (Annual Monitoring Report)	60	Oct-2014		Oct-2014	The 1st and 2nd year of quarterly sampling was completed in Dec 2014. Will submit another report following recipt of data in 2015.
	Draft Year 2 Quarterly Monitoring Report		Apr-2015	Aug-2015		Following sampling in Dec, obtain data at end of Jan 2015; DV and QC data checks complete by March 2015; then prepare report.
	Final Year 2 Quarterly Monitoring Report		Jul-2015	Oct-2015		
	Complete Year 3 Quarterly Monitoring		Nov-2015	Dec-2015		Newly added to schedule
	Draft Year 3 Quarterly Monitoring Report		Apr-2016			
	Final Year 3 Quarterly Monitoring Report		Jul-2016			
	Complete Fieldwork (north plume)		Mar-2015	Sep-2015		Further characterization is necessary to complete delineation of the North Plume. Fieldwork scheduled after June 15, 2015 (end of Bald Eagle nesting season.)
	Complete Draft Tech Memo	120	Aug-2015	Nov-2015		Pushed out to accommodate the additional investigations using screening tool data to place and sample permanent monitoring wells. .
	Complete Final Tech Memo	30	Sep-2015	Jan-2016		
	Complete Proposed Plan					Newly added to schedule
	Complete Draft PP (revised)		Jan-2016	Dec-2016		Date is bsed on completion of large-scale demonstration in north plume which will be completed after June 15, 2016 (Bald Eagle nesting season)
	Complete Final PP (revised)	60	Apr-2016	Mar-2017		
	Complete RoD					Newly added to schedule
	Complete Draft RoD Amendment	60	Mar-2016	Feb-2017		Assumed that a RoD Amendment is needed based on fundamental changes to the selected remedy for groundwater in the north plume.
	Complete Final RoD Amendment	60	Jun-2016	May-2017		
	RoD Amendment Signed		Jun-2017			
	Complete LTMP					
	Complete Pre-Draft LTM UFP-SAP		Dec-2015	Feb-2016		Newly added to schedule
	Complete Draft LTM UFP-SAP		Jan-2016	May-2016		
	Complete Final LTM UFP-SAP		Mar-2016	Aug-2016		
	Complete Draft LTMP		Jul-2015	Dec-2015		Depends on Year 2 quarterly sampling results for the South Plume and additional characterization of the North Plume.
	Complete Final LTMP	60	Sep-2015	Mar-2016		
	Complete RACR					Draft IRACR completed in June 2014
	Complete Final IRACR (South Plume)		Nov-2014	Aug-2015		Delayed on EPA determination on separation of North and South plumes and have 2 RACRs for 1 site.
	Complete Final RACR (North Plume)		Sep-2017			Final RACR to be completed after north plume work and ROD Amendment are complete.

TABLE 4-1
SCHEDULE (FY15-FY16)
NSFIH, INDIAN HEAD, MARYLAND

As of 8/20/2015 for 4th Quarter FY15

SITE	GOAL/MILESTONE	DUR[1]	PLANNED DATE	REVISED DATE	ACTUAL DATE	COMMENTS
Site 21	OU 15 - Bronson Road Landfill					Major contaminants: potential metals in GW; Exit strategy: Capping, LTM; Last milestone: Final RACR- 6/14; NORM RC Date: 2/26/14
	Long-Term Monitoring					
	Complete LTM Events		Sep-2015			Site will undergo biannual LTM for groundwater
Site 28	OU 21 - Original Burning Ground					Major contaminants: Zinc in soil & GW; Exit strategy: Removal & LTM; Last milestone: Final ROD- 6/14; NORM RC Date: 8/10/09
	Complete RACR					
	Complete Final IRACR		Jan-2015	Dec-2015		To be done in-house; depends on LUC RD and LTMP completion
	Complete LUC RD					
	Complete Draft LUC RD		Oct-2014		May-2015	
	Complete Final LUC RD	30	Nov-2014	May-2015		To be done in-house
	Complete LTMP					
	Complete Draft LTMP		Jan-2015		Jul-2015	Delayed by funding award
	Complete Final LTMP	60	Mar-2015	Sep-2015		
Site 36	OU 22 - Closed Landfill					Major contaminants: potential metals in GW; Exit strategy: LTM; Last milestone: Final RACR- 9/14; NORM RC Date: 6/16/14
	Long-Term Monitoring					
	Complete LTM Events		Sep-2015			Site will undergo biannual LTM for groundwater
Site 38	OU 24 - Rum Point Landfill					Major contaminants: Mn in groundwater; Probable exit strategy: landfill excavation & LTM; Last milestone- Final RD- 7/14; NORM RC Date: 7/13/15
	Complete Remedial Action					
	Complete Final UFP-SAP		Oct-2014	Feb-2015	Mar-2015	
	Complete Draft RA Work Plan	30	Oct-2014		Oct-2014	
	Complete Final RA Work Plan	60	Dec-2014	Feb-2015	Mar-2015	
	Start Construction (RA Start)	30	Jan-2015	Sep-2015		Delayed by NOSSA review of ESS
	Complete Construction - RIP	60	Mar-2015	Jan-2016		
	Complete Closeout Report	30	Apr-2015	Mar-2016		
	Response Complete		Jul-2015	Mar-2016		
	Complete RACR					
	Complete Final RACR (FY15 RC Goal)		Jun-2015	May-2016		Will not be complete in FY15
	Complete LUC RD					
	Complete Final LUC RD		Nov-2014	Jun-2015	Jan-2015	Part of RD; Draft version completed in September 2014
	Complete LTMP					
	Complete Final LTMP		Nov-2014	Apr-2016		Groundwater characterization to be completed after landfill is removed; LTM may not be needed depending on results.
Site 42	OU 05 - Olsen Road Landfill					Major contaminants: Metals in GW; Exit strategy: Capping & LTM; Last milestone: LTM Report- 11/13; NORM RC Date: 12/20/06
	Long-Term Monitoring					
	Complete LTM Events		Sep-2015			Site undergoing LTM for groundwater every 9 months
Site 43	OU 25 - Toluene Disposal					Major contaminants: TCE in GW; Probable exit strategy: TBD; Last milestone- Draft RI Report- 2/14; NORM RC Date: 10/15/25
	Complete Remedial Investigation					
	Complete Final RI Report	90	Oct-2014		Oct-2014	
	Complete Feasibility Study					
	Complete Draft FS	60	Nov-2014	Feb-2015	Mar-2015	Navy internal RAA submitted & reviewed in December 2014. Draft FS delayed to finalize RI risk management decisions and potentially to perform additional vapor intrusion evaluation for periphery structures and groundwater cobalt sampling.
	Complete Final FS	60	Jan-2015	Aug-2016		Delayed to incorporate results of Pre-Design Investigation (PDI); PP/ROD will address PDI results.
	Complete Pre-Design Investigation					Newly added to schedule
	Complete Pre-Draft UFP-SAP	30	Jul-2015	Aug-2015		
	Complete Draft UFP-SAP	60	Aug-2015	Sep-2015		
	Complete Final UFP-SAP	30	Nov-2015	Dec-2015		
	Complete PDI Field Work		Jan-2016	Feb-2016		
	Complete Draft PDI Tech Memo	90	May-2016			
	Complete Final PDI Tech Memo	90	Aug-2016			Will be included in FS
	Complete Proposed Plan					
	Complete Draft PP		Feb-2015	TBD		Delayed by additional cobalt investigation to determine if cobalt is associated with site operations and directly (or indirectly) a result of a CERCLA release.
	Complete Final PP	60	Apr-2015	TBD		
	Complete RoD					
	Complete Pre-Draft RoD		Feb-2015	TBD		
	Complete Draft RoD	60	Apr-2015	TBD		
	Complete Final RoD	60	Jun-2015	TBD		
	RoD Signed		Jun-2015	TBD		
	Complete Remedial Design					
	Complete 35% RD		Jul-2015	TBD		
	Complete 100% RD	60	Sep-2015	TBD		
	Complete Final RD	60	Oct-2015	TBD		
	Complete LUC RD					
	Draft LUC RD		Sep-2015	TBD		
	Final LUC RD	30	Oct-2015	TBD		
	Complete LTMP					LTM Plan or RAO?
	Draft LTM Plan		Sep-2015	TBD		
	Final LTM Plan	30	Oct-2015	TBD		
	Complete Remedial Action					
	Award Remedial Action		Dec-2015	TBD		Award date could be sooner or later depedning on availability of funds. (RA currently funded in FY16.)
	Complete Draft RA Work Plan	60	Jan-2016	TBD		
	Complete Final RA Work Plan	30	Feb-2016	TBD		
	Start Construction	30	Mar-2016	TBD		
	Complete Construction - RIP	60	May-2016	TBD		
	Complete Closeout Report	30	Jun-2016	TBD		
	Complete IRACR					
	Complete Final IRACR		Sep-2016	TBD		
Site 47	OU 07 - Mercuric Nitrate Disposal Area					Major contaminants: TCE in groundwater; Exit strategy: ISCO injection with MNA; Last milestone: 9-mo. Post-injection RA-O- 8/14; NORM RC Date: 4/25/50
	Complete Short-term Performance Monitoring					
	Draft Annual Monitoring Report		Jan-2015	Aug-2015		Delayed because of lab integrity of baseline and 2-month samples
	Final Annual Monitoring Report		Apr-2015	Oct-2015		
	Complete Year 2 Monitoring Fieldwork		Nov-2015	Dec-2015		Newly added to schedule. Based on preliminary data, additional montitoring will have to be done as Year 2 monitoring. 4 rounds of sampling will be done - Mar, June, Sept, and Dec 2015.
	Draft Annual Monitoring Report		Mar-2016	Apr-2016		
	Final Annual Monitoring Report		May-2016	Jun-2016		
	Complete LTMP					
	Complete Draft LTMP		Oct-2014	May-2016		LTM Plan or RAO?
	Complete Final LTMP	60	Dec-2014	Jul-2016		
	Complete Remedial Action					
	Complete Draft Closeout Report		Dec-2014	May-2016		Phase II (injection) completed in November 2013.
	Complete Final Closeout Report	60	Mar-2015	Jul-2016		Will include post injection monitoring results
	Complete IRACR					Draft RACR completed in July 2014
	Complete Final IRACR		Jan-2015	Aug-2015		To be done in-house (for injection work only)

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SITE	GOAL/MILESTONE	DUR[1]	PLANNED DATE	REVISED DATE	ACTUAL DATE	COMMENTS
Site 57	**OU 01 - Building 292 TCE Contamination**					Major contaminants: TCE in groundwater; Exit strategy: ISCR with LTM & MNA; Last milestone: Final PRT Evaluation Report- 11/13; NORM RC Date: 9/25/49
	Complete Remedial Action					
	Complete Final Full-Scale PRT Plan	30	Oct-2014	Dec-2014	Feb-2015	Draft PRT Plan completed in July 2014
	Complete RA-O Fieldwork		Nov-2014	May-2015	May-2015	Fieldwork delayed until Spring (need warm weather for injections.)
	Complete Draft Post-RA-O Fieldwork Report	60	Jan-2015	Aug-2015		
	Complete Final Post-RA-O Fieldwork Report	90	Mar-2015	Oct-2015		
	Long-Term Monitoring					
	Complete LTM (RA-O) Events		May-2015	Apr-2016		Site will undergo RA-O for groundwater; date indicates end of first year of PRT operation.
	Complete IRACR					
	Complete Draft IRACR		May-2015	Jun-2016		
	Complete Final IRACR		Jul-2015	Aug-2016		To be done in-house following completion of RA-O for PRT system.
Site 66	**OU 17 - Turkey Run Disposal Area**					Major contaminants: metals in soil and subsurface soil; Probable exit strategy: capping or removal; Last milestone: Final RI Report- 2/12; NORM RC Date: 9/30/20
	Complete Pre-FS Investigation & BERA					
	Complete Final UFP-SAP	30	Oct-2014		Oct-2014	Based on FEAD's approval of HASP.
	Complete Pre-FS & BERA Field Work		Jun-2015	Sep-2015		Delay in funding and ability to collect in situ gw data
	Complete Draft Tech Memo	90	Nov-2015	Mar-2016		
	Complete Final Tech Memo	90	Feb-2016	Jun-2016		
	Complete Feasibility Study					
	Complete Pre-Draft FS		Mar-2016	Jul-2016		
	Complete Draft FS	90	May-2016	Oct-2016		
	Complete Final FS	60	Aug-2016	Jan-2017		
	Complete Proposed Plan					
	Complete Draft PP		Aug-2016	TBD		
	Complete Final PP	60	Oct-2016	TBD		
	Complete RoD					
	Complete Pre-Draft RoD		Oct-2016	TBD		
	Complete Draft RoD	30	Dec-2016	TBD		
	Complete Final RoD	60	Feb-2017	TBD		
	RoD Signed	30	Mar-2017	TBD		
	Complete Remedial Design					
	Complete 35% RD		Mar-2017	TBD		
	Complete 100% RD	120	May-2017	TBD		
	Complete Final RD	90	Jul-2017	TBD		
	Complete LUC RD					
	Draft LUC RD		Apr-2017	TBD		
	Final LUC RD	30	May-2017	TBD		
	Complete LTMP					
	Draft LTM Plan		Apr-2017	TBD		
	Final LTM Plan	30	May-2017	TBD		
	Complete Remedial Action					
	Award Remedial Action		May-2017	TBD		
	Complete Draft RA Work Plan	30	Jun-2017	TBD		
	Complete Final RA Work Plan	60	Aug-2017	TBD		
	Start Construction	30	Sep-2017	TBD		
	Complete Construction - RIP	60	Nov-2017	TBD		
	Complete Closeout Report	30	Dec-2017	TBD		
	Complete RACR					
	Complete Final RACR		Feb-2018	TBD		
Site 67	**OU 28 - Hog Out Facility**					Major contaminants: Perchlorate in groundwater; Probable exit strategy: Potential source treatment with MNA; Last milestone: Fieldwork completed- 8/13; NORM RC Date: 7/31/20
	Complete Remedial Investigation					
	Complete RI Field Work		Jul-2015	Oct-2015		Contamination plume larger than expected. Fieldwork will have to be scheduled around explosive operations at Building 1419 and other buildings. Groundwater perchlorate plume(s) larger than expected with multiple hot spots/sources.
	Complete Draft RI Report	120	Sep-2015	Dec-2015		RI Report may be delayed if Phase 3 RI fieldwork is needed
	Complete Final RI Report	90	Nov-2015	Feb-2016		
	Complete Feasibility Study					
	Complete Pre-Draft FS		Oct-2015	Jan-2016		
	Complete Draft FS	60	Nov-2015	Feb-2016		
	Complete Final FS	90	Dec-2015	Apr-2016		
	Complete Proposed Plan					
	Complete Draft PP		Dec-2015	Apr-2016		
	Complete Final PP	90	Feb-2016	Jun-2016		
	Complete RoD					
	Complete Pre-Draft RoD		Dec-2015	Apr-2016		
	Complete Draft RoD	60	Feb-2016	Jun-2016		
	Complete Final RoD	60	Apr-2016	Aug-2016		
	RoD Signed		May-2016	Sep-2016		
	Complete Remedial Design					
	Complete 35% RD		Apr-2016	Aug-2016		
	Complete 100% RD	90	Jun-2016	Oct-2016		
	Complete Final RD	60	Jul-2016	Nov-2016		
	Complete LUC RD					
	Draft LUC RD		Jun-2016	Oct-2016		
	Final LUC RD	60	Jul-2016	Nov-2016		
	Complete LTMP					LTM Plan or RAO?
	Draft LTM Plan		Jun-2016	Oct-2016		
	Final LTM Plan	60	Jul-2016	Nov-2016		
	Complete Remedial Action					
	Award Remedial Action		Jun-2016	Jul-2016		
	Complete Draft RA Work Plan	30	Jul-2016	Dec-2016		
	Complete Final RA Work Plan	60	Aug-2016	Feb-2017		
	Start Construction	30	Sep-2016	Mar-2017		
	Complete Construction - RIP	60	Nov-2016	May-2017		
	Complete Closeout Report	30	Dec-2016	Jun-2017		
	Complete RACR					
	Complete Final RACR		Jan-2017	Jul-2017		
Site 69	**OU X - Building 1018**					Major contaminants: perchlorate in soil; Probable exit strategy: TBD; Last milestone: Fieldwork completed- 7/13; NORM RC Date: 10/12/27
	Complete Remedial Investigation					
	Start RI		Jan-2015	May-2015	May-2015	Delayed due to award of funding
	Complete Draft UFP-SAP/RI Work Plan		Mar-2015	Sep-2015		
	Complete Final UFP-SAP/RI Work Plan	30	May-2015	Nov-2015		
	Complete Field Work		Jun-2015	Dec-2015		
	Complete Draft RI Report	90	Aug-2015	Apr-2016		
	Complete Final RI Report	30	Sep-2015	Jun-2016		
	Complete Feasibility Study					
	Complete Pre-Draft FS		Sep-2015	Mar-2016		
	Complete Draft FS	90	Oct-2015	Apr-2016		
	Complete Final FS	60	Dec-2015	Jun-2016		
	Complete Proposed Plan					
	Complete Draft PP		Dec-2015	Jun-2016		
	Complete Final PP	90	Feb-2016	Aug-2016		

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SITE	GOAL/MILESTONE	DUR[1]	PLANNED DATE	REVISED DATE	ACTUAL DATE	COMMENTS
	Complete RoD					
	Complete Pre-Draft RoD		Dec-2015	Jun-2016		
	Complete Draft RoD	60	Feb-2016	Aug-2016		
	Complete Final RoD	60	Apr-2016	Oct-2016		
	RoD Signed		May-2016	Nov-2016		
Site 70	**OU 26 - Groundwater Contamination Along Water Works Way**					Major contaminants: TCE in groundwater; Probable exit strategy: TBD; Last milestone: new site; NORM RC Date: 10/12/27
	Complete Remedial Investigation					GW investigation to determine source of TCE upgradient of Scrap Yard
	Complete Draft UFP-SAP Addendum		Oct-2014	Jan-2015	Mar-2015	
	Complete Final UFP-SAP Addendum	90	Dec-2014		Jun-2015	
	Complete GW Field Work		Jan-2015	Oct-2015		
	Complete Draft RI Report	120	Mar-2015	Dec-2015		
	Complete Final RI Report	90	May-2015	Feb-2016		
	Complete Feasibility Study					
	Complete Pre-Draft FS		Feb-2016	TBD		FS/PP/ROD to be funded In FY16
	Complete Draft FS	90	Mar-2016	TBD		
	Complete Final FS	60	May-2016	TBD		
	Complete Proposed Plan					
	Complete Draft PP		May-2016	TBD		
	Complete Final PP	60	Jul-2016	TBD		
	Complete RoD					
	Complete Pre-Draft RoD		Jun-2016	TBD		
	Complete Draft RoD	30	Jul-2016	TBD		
	Complete Final RoD	60	Sep-2016	TBD		
	RoD Signed	30	Sep-2016	TBD		
	Complete Remedial Design					
	Complete 35% RD		Oct-2016	TBD		
	Complete 100% RD	120	Nov-2016	TBD		
	Complete Final RD	90	Jan-2017	TBD		
	Complete LUC RD					
	Draft LUC RD		Nov-2016	TBD		
	Final LUC RD	30	Jan-2017	TBD		
	Complete LTMP					
	Draft LTM Plan		Nov-2016	TBD		
	Final LTM Plan	30	Jan-2017	TBD		
	Complete Remedial Action					
	Award Remedial Action		TBD	TBD		
	Complete Draft RA Work Plan	30	TBD	TBD		
	Complete Final RA Work Plan	60	TBD	TBD		
	Start Construction	30	TBD	TBD		
	Complete Construction - RIP	60	TBD	TBD		
	Complete Closeout Report	30	TBD	TBD		
	Complete RACR					Date will depend on when funding is available
	Complete Final RACR		TBD	TBD		
UXO 1	**OU X - Air Blast Pond**					Major contaminants: MPPEH in soil; Probable exit strategy: removal & LUCs; Last milestone: Final SI Report- 9/10; NORM RC Date: 4/30/20
	Complete Remedial Investigation		Sep-2017			
UXO 2	**OU X - Area 8**					Major contaminants: MPPEH & MC in soil and groundwater; Probable exit strategy: removal & LUCs; Last milestone: Final SI Report- 9/10; NORM RC Date: 9/30/21
	Complete Remedial Investigation		Sep-2017			
UXO 4	**OU 29 - IED Area**					Major contaminants: MPPEH in soil; Probable exit strategy: Removal & LUCs; Last milestone: Draft RI Work Plan- 2/13; NORM RC Date: 1/29/21
	Complete Remedial Investigation					
	Complete Final RI UFP-SAP WP & ESS	60	Oct-2014	Aug-2015		Delayed by ESS review time and EPA tech support review
	Complete RI Field Work (MEC/MC)	120	Dec-2014	Nov-2015		Includes surface sweep, DGM, and anomaly excavation
	Complete Draft RI Report	90	Mar-2015	Feb-2016		
	Complete Final RI Report	90	May-2015	May-2016		
	Complete Feasibility Study					
	Complete Pre-Draft FS		Jun-2015	May-2016		
	Complete Draft FS	60	Aug-2015	Jun-2016		
	Complete Final FS	90	Oct-2015	Sep-2016		
	Complete Proposed Plan					
	Complete Draft PP		Oct-2015	TBD		
	Complete Final PP	90	Dec-2015	TBD		
	Complete RoD					
	Complete Pre-Draft RoD		Oct-2015	TBD		
	Complete Draft RoD	60	Nov-2015	TBD		
	Complete Final RoD	60	Jan-2016	TBD		
	RoD Signed		Jan-2016	TBD		
	Complete Remedial Design					
	Complete 35% RD		Dec-2016	TBD		RD contract award in FY17 when funds are available
	Complete 100% RD	90	Mar-2017	TBD		
	Complete Final RD	60	May-2017	TBD		
	Complete Remedial Action					
	Award Remedial Action		Jul-2019	TBD		RA contract award in FY19 when funds are available
	Complete Draft RA Work Plan	30	Aug-2019	TBD		
	Complete Final RA Work Plan	60	Oct-2019	TBD		
	Start Construction	30	Oct-2019	TBD		
	Complete Construction - RIP	60	Dec-2019	TBD		
	Complete Closeout Report	30	Jan-2020	TBD		
	Complete RACR					
	Complete Final RACR		Feb-2020	TBD		
UXO 5	**OU X - Advanced IED Area**					Major contaminants: MPPEH in soil; Probable exit strategy: removal & LUCs; Last milestone: Final SI Report- 9/10; NORM RC Date: 12/30/20
	Complete Remedial Investigation					
	Complete Final RI UFP-SAP WP & ESS	60	Oct-2014	Aug-2015		Delayed by ESS review time and EPA tech support review
	Complete RI Field Work (MEC/MC)	120	Dec-2014	Nov-2015		Includes surface sweep, DGM, and anomaly excavation
	Complete Draft RI Report	90	Mar-2015	Feb-2016		
	Complete Final RI Report	60	May-2015	May-2016		
	Complete Feasibility Study					
	Complete Pre-Draft FS		Jun-2015	May-2016		
	Complete Draft FS	60	Aug-2015	Jun-2016		
	Complete Final FS	90	Oct-2015	Sep-2016		
	Complete Proposed Plan					
	Complete Draft PP		Oct-2015	TBD		
	Complete Final PP	90	Dec-2015	TBD		
	Complete RoD					
	Complete Pre-Draft RoD		Oct-2015	TBD		
	Complete Draft RoD	60	Nov-2015	TBD		
	Complete Final RoD	60	Jan-2016	TBD		
	RoD Signed		Jan-2016	TBD		
	Complete Remedial Design					
	Complete 35% RD		Dec-2015	TBD		RD contract award in FY16 when funds are available
	Complete 100% RD	90	Mar-2016	TBD		
	Complete Final RD	60	May-2016	TBD		
	Complete Remedial Action					
	Award Remedial Action		Jul-2018	TBD		RA contract award in FY18 when funds are available
	Complete Draft RA Work Plan	30	Aug-2018	TBD		
	Complete Final RA Work Plan	60	Oct-2018	TBD		
	Start Construction	30	Oct-2018	TBD		
	Complete Construction - RIP	60	Dec-2018	TBD		
	Complete Closeout Report	30	Jan-2019	TBD		

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SITE	GOAL/MILESTONE	DUR[1]	PLANNED DATE	REVISED DATE	ACTUAL DATE	COMMENTS
	Complete RACR					
	Complete Final RACR		Feb-2019	TBD		
UXO 6	**OU X - NG Slums Burning Ground**					Major contaminants: MC in soil & GW; Probable exit strategy: removal & LUCs; Last milestone: Final SI Report- 9/10; NORM RC Date: 5/6/20
	Complete Remedial Investigation		Sep-2018			
UXO 9	**OU 30 - Single-Base Propellant Grain Spill Area**					Major contaminants: Propellant grains in surface and subsurface soil; Probable exit strategy: Removal & LUCs; Last milestone: Draft RI Report- 3/14; NORM RC Date: 12/28/20
	Complete Remedidial Investigation					
	Complete Final RI Report	90	Nov-2014	Feb-2017		Will be delayed for the following reasons: (1) need to resolve EPA's comments; and (2) arsenic along the tracks
	Additional Fieldwork					
	Complete Pre-Draft UFP-SAP		Oct-2015	Dec-2015		
	Complete Draft UFP-SAP		Dec-2015	Feb-2016		
	Complete Final UFP-SAP		Mar-2016	May-2016		
	Complete Fieldwork		Jun-2016	Jul-2016		
	Complete Draft Tech Memo		Oct-2016			
	Complete Final Tech Memo		Dec-2016			
	Complete Feasibility Study					
	Complete Pre-Draft FS		May-2015	Apr-2017		
	Complete Draft FS	60	Jul-2015	Jun-2017		
	Complete Final FS	90	Sep-2015	Sep-2017		
	Complete Proposed Plan					
	Complete Draft PP		Sep-2015	Sep-2017		
	Complete Final PP	90	Dec-2015	Dec-2017		
	Complete RoD					
	Complete Pre-Draft RoD		Dec-2015	Dec-2017		
	Complete Draft RoD	60	Feb-2016	Feb-2018		
	Complete Final RoD	60	May-2016	May-2018		
	RoD Signed		Aug-2016	Aug-2018		
	Complete Remedial Design					
	Complete 35% RD		Dec-2016	Dec-2018		RD contract award in FY17
	Complete 100% RD	90	Mar-2017	Mar-2019		
	Complete Final RD	60	May-2017	May-2019		
	Complete Remedial Action					
	Award Remedial Action		Jul-2019	TBD		RA contract award in FY19
	Complete Draft RA Work Plan	30	Aug-2019	TBD		
	Complete Final RA Work Plan	60	Oct-2019	TBD		
	Start Construction	30	Oct-2019	TBD		
	Complete Construction - RIP	60	Dec-2019	TBD		
	Complete Closeout Report	30	Jan-2020	TBD		
	Complete LUC RD					
	Complete Draft LUC RD		Mar-2017	Mar-2019		
	Complete Final LUC RD	60	May-2017	May-2019		
	Complete LTMP					
	Complete Draft LTMP		Mar-2017	Mar-2019		
	Complete Final LTMP	60	May-2017	May-2019		
	Complete RACR					
	Complete Final RACR		Feb-2020			
UXO 10	**OU X - Stump Neck Impact Area**					Major contaminants: MPPEH in soil; Probable exit strategy: removal & LUCs; Last milestone: Final SI Report- 9/10; NORM RC Date: 9/30/20
	Complete Remedial Investigation		Sep-2017			
UXO 11	**OU 31 - The Valley**					Major contaminants: MPPEH in soil; Probable exit strategy: LUCs; Last milestone: Anomaly Investigation Fieldwork- 5/14; NORM RC Date: 8/30/21
	Complete Remedidial Investigation					
	Complete Draft RI Report	60	Nov-2014	Feb-2015	Mar-2015	
	Complete Final RI Report	90	Feb-2015	Sep-2015		
	BERA					
	Complete Pre-Draft UFP-SAP		Oct-2015	Dec-2015		
	Complete Draft UFP-SAP		Dec-2015	Feb-2016		
	Complete Final UFP-SAP		Mar-2016	May-2016		
	Complete Fieldwork		Jun-2016	Jul-2016		
	Complete Draft BERA Report		Oct-2016	Dec-2016		
	Complete Final BERA Report		Dec-2016	Feb-2016		
	Complete Feasibility Study					
	Complete Pre-Draft FS		Mar-2015	Feb-2017		RAA needs to be done. Will be started after the BERA report.
	Complete Draft FS	60	May-2015	Apr-2017		
	Complete Final FS	90	Aug-2015	Jul-2017		
	Complete Proposed Plan					
	Complete Draft PP		Apr-2015	Jul-2017		
	Complete Final PP	90	Jul-2015	Oct-2017		
	Complete RoD					
	Complete Pre-Draft RoD		May-2015	Dec-2017		
	Complete Draft RoD	60	Jul-2015	Feb-2018		
	Complete Final RoD	60	Oct-2015	May-2018		
	RoD Signed		Oct-2015	TBD		
	Complete Remedial Design					
	Complete 35% RD		Jan-2019	TBD		RD contract award in FY19 when funds are available
	Complete 100% RD	90	Apr-2019	TBD		
	Complete Final RD	60	Jun-2019	TBD		
	Complete Remedial Action					
	Award Remedial Action		Dec-2019	TBD		RA contract award in FY20 when funds are available
	Complete Draft RA Work Plan	30	Jan-2020	TBD		
	Complete Final RA Work Plan	60	Mar-2020	TBD		
	Start Construction	30	Apr-2020	TBD		
	Complete Construction - RIP	60	Jun-2020	TBD		
	Complete Closeout Report	30	Jul-2020	TBD		
	Complete LUC RD					
	Complete Draft LUC RD		Apr-2019	TBD		
	Complete Final LUC RD	60	Jun-2019	TBD		
	Complete LTMP					
	Complete Draft LTMP		Apr-2019	TBD		
	Complete Final LTMP	60	Jun-2019	TBD		
	Complete RACR					
	Complete Final RACR		Aug-2020	TBD		
UXO 12	**OU X - Torpedo Burial Site**					Major contaminants: MPPEH in soil; Probable exit strategy: removal & LUCs; Last milestone: Final SI Report- 9/10; NORM RC Date: 9/25/20
	Complete Remedial Investigation					
	Complete Final RI UFP-SAP WP & ESS	60	Oct-2014	Aug-2015		Delayed by ESS review time and EPA tech support review
	Complete RI Field Work (MEC/MC)	120	Dec-2014	Nov-2015		Includes surface sweep, DGM, and anomaly excavation
	Complete Draft RI Report	90	Mar-2015	Feb-2016		
	Complete Final RI Report	60	May-2015	May-2016		
	Complete Feasibility Study					
	Complete Pre-Draft FS		Jun-2015	May-2016		
	Complete Draft FS	60	Aug-2015	Jun-2016		
	Complete Final FS	90	Oct-2015	Sep-2016		
	Complete Proposed Plan					
	Complete Draft PP		Oct-2015	TBD		
	Complete Final PP	90	Dec-2015	TBD		

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SITE	GOAL/MILESTONE	DUR[1]	PLANNED DATE	REVISED DATE	ACTUAL DATE	COMMENTS
	Complete RoD					
	Complete Pre-Draft RoD		Oct-2015	TBD		
	Complete Draft RoD	60	Nov-2015	TBD		
	Complete Final RoD	60	Jan-2016	TBD		
	RoD Signed		Jan-2016	TBD		
	Complete Remedial Design					
	Complete 35% RD		Dec-2018	TBD		RD contract award in FY19 when funds are available
	Complete 100% RD	90	Mar-2019	TBD		
	Complete Final RD	60	May-2019	TBD		
	Complete Remedial Action					
	Award Remedial Action		Jul-2020	TBD		RA contract award in FY20 when funds are available
	Complete Draft RA Work Plan	30	Aug-2020	TBD		
	Complete Final RA Work Plan	60	Oct-2020	TBD		
	Start Construction	30	Oct-2020	TBD		
	Complete Construction - RIP	60	Dec-2020	TBD		
	Complete Closeout Report	30	Jan-2021	TBD		
	Complete RACR					
	Complete Final RACR		Feb-2021	TBD		
UXO 13	**OU X - FDR Skeet Range**					Major contaminants: metals in soil; Probable exit strategy: removal; Last milestone: Final SI Report- 9/10; NORM RC Date: 1/30/20
	Complete Remedial Investigation		Sep-2016			
UXO 14	**OU X - Marine Rifle Range**					Major contaminants: metals in soil; Probable exit strategy: removal; Last milestone: EE/CA- 11/12; NORM RC Date: 8/30/21
	Refer to Stump Neck MRP Small Arms Ranges below					
UXO 15	**OU X - Old Skeet & Trap Range**					Major contaminants: metals in soil; Probable exit strategy: removal; Last milestone: EE/CA- 11/12; NORM RC Date: 7/10/20
	Refer to Stump Neck MRP Small Arms Ranges below					
UXO 16	**OU X - Rum Point Skeet Range**					Major contaminants: metals in soil; Probable exit strategy: removal; Last milestone: EE/CA- 11/12; NORM RC Date: 2/12/20
	Refer to Stump Neck MRP Small Arms Ranges below					
UXO 17	**OU X - Small Arms (Pistol) Range**					Major contaminants: metals in soil; Probable exit strategy: removal; Last milestone: EE/CA- 11/12; NORM RC Date: 2/22/21
	Refer to Stump Neck MRP Small Arms Ranges below					
UXO 18	**OU X - Battle Range Firing Area**					Major contaminants: MPPEH/water site; Probable exit strategy: removal & LUCs; Last milestone: Final SI Report- 9/10; NORM RC Date: 10/1/22
	Complete Remedial Investigation		Sep-2018			
UXO 19	**OU X - Igniter Area**					Major contaminants: MPPEH in shallow water; Probable exit strategy: removal & LUCs; Last milestone: DGM Fieldwork- 5/13; NORM RC Date: 9/30/21
	Complete Remedial Investigation					
	Complete Draft RI UFP-SAP WP & ESS		Jan-2018			RI to be funded in FY18
	Complete Final RI UFP-SAP WP & ESS	30	Mar-2018			
	Complete RI Field Work (MEC/MC)	120	Apr-2018			
	Complete Draft RI Report	90	Jun-2018			
	Complete Final RI Report	60	Aug-2018			
UXO 20	**OU 32 - Safety Thermal Treatment Point**					Major contaminants: MPPEH & MC in soil; Probable exit strategy: removal & LUCs; Last milestone: Fieldwork- 5/14; NORM RC Date: 3/30/18
	Complete Remedial Investigation					
	Complete Pre-Draft RI UFP-QAPP & ESS			Oct-2015		
	Complete Draft RI UFP-QAPP & ESS		Sep-2015	Dec-2015		
	Complete Final RI UFP-SAP & ESS	180	Mar-2016	Mar-2016		ESS assumed to take 6 months for approval.
	Complete MC and MEC Fieldwork - Phase 2		Mar-2016	Aug-2016		Phase 2 is for intrusive investigation of DGM anomalies; to be done under a new contract. MWs were not installed as part of Phase I MC investigation; will need to be done concurrently with the intrusive MEC investigation. Will need an ESS and a QAPP for the intrusive investigation, which pushes out the schedule for completion of the fieldwork.
	Complete Draft RI Report	60	Aug-2016	Jan-2017		
	Complete Final RI Report	90	Nov-2106	Apr-2017		
	Complete Feasibility Study					
	Complete Pre-Draft FS		Oct-2016	May-2017		
	Complete Draft FS	60	Nov-2016	Jul-2017		
	Complete Final FS	90	Jan-2017	Oct-2017		
	Complete Proposed Plan					
	Complete Draft PP		Feb-2017	Jan-2018		
	Complete Final PP	90	Apr-2017	Apr-2018		
	Complete RoD					
	Complete Pre-Draft RoD		Mar-2017	May-2018		
	Complete Draft RoD	60	Apr-2017	Jul-2018		
	Complete Final RoD	60	Jun-2017	Oct-2018		
	RoD Signed		Jul-2017	Jan-2019		
	Complete Remedial Design					
	Complete 35% RD		Jun-2017	Feb-2019		
	Complete 100% RD	90	Aug-2017	Apr-2019		
	Complete Final RD	60	Oct-2017	Jul-2019		
	Complete Remedial Action					
	Award Remedial Action		Sep-2017	TBD		Depends on availability of funding.
	Complete Draft RA Work Plan	30	Nov-2017	TBD		
	Complete Final RA Work Plan	60	Jan-2018	TBD		
	Start Construction	30	Feb-2018	TBD		
	Complete Construction - RIP	60	Mar-2018	TBD		
	Complete Closeout Report	30	Apr-2018	TBD		
	Complete LUC RD					
	Complete Draft LUC RD		Aug-2017	TBD		
	Complete Final LUC RD	30	Sep-2017	TBD		
	Complete LTMP					
	Complete Draft LTMP		Aug-2017	TBD		
	Complete Final LTMP	30	Sep-2017	TBD		
	Complete RACR					
	Complete Final RACR		May-2018	TBD		
UXO 21	**OU 33 - Test Area 1**					Major contaminants: MPPEH in soil; Probable exit strategy: Removal & LUCs; Last milestone: Draft Work Plan- 2/13; NORM RC Date: 9/30/18
	Complete Remedidial Investigation					
	Complete Final RI UFP-SAP WP & ESS	60	Oct-2014	Aug-2015		Delayed by ESS review time and EPA tech support review
	Complete RI Field Work (MEC/MC)	120	Dec-2014	Nov-2015		Includes surface sweep, DGM, and anomaly excavation
	Complete Draft RI Report	90	Mar-2015	Feb-2016		
	Complete Final RI Report	60	May-2015	May-2016		
	Complete Feasibility Study					
	Complete Pre-Draft FS		Jun-2015	May-2016		
	Complete Draft FS	60	Aug-2015	Jun-2016		
	Complete Final FS	90	Oct-2015	Sep-2016		
	Complete Proposed Plan					
	Complete Draft PP		Oct-2015	TBD		
	Complete Final PP	90	Dec-2015	TBD		
	Complete RoD					
	Complete Pre-Draft RoD		Oct-2015	TBD		
	Complete Draft RoD	60	Nov-2015	TBD		
	Complete Final RoD	60	Jan-2016	TBD		
	RoD Signed		Jan-2016	TBD		
	Complete Remedial Design					
	Complete 35% RD		Dec-2015	TBD		RD contract award in FY16 when funds are available
	Complete 100% RD	30	Jan-2016	TBD		
	Complete Final RD	60	Mar-2016	TBD		

TABLE 4-1
SCHEDULE (FY15-FY16)
NSFIH, INDIAN HEAD, MARYLAND

As of 8/20/2015 for 4th Quarter FY15

SITE	GOAL/MILESTONE	DUR[1]	PLANNED DATE	REVISED DATE	ACTUAL DATE	COMMENTS
	Complete Remedial Action					
	Award Remedial Action		Feb-2016	TBD		
	Complete Draft RA Work Plan	30	Apr-2016	TBD		
	Complete Final RA Work Plan	60	Jun-2016	TBD		
	Start Construction	30	Jul-2016	TBD		
	Complete Construction - RIP	60	Sep-2016	TBD		
	Complete Closeout Report	30	Oct-2016	TBD		
	Complete RACR					
	Complete Final RACR		Nov-2016	TBD		
UXO 23	**OU X - Torpedo Casing Disposal Area**					Major contaminants: MPPEH in soil; Probable exit strategy: removal & LUCs; Last milestone: Final SI Report- 9/10; NORM RC Date: 5/26/20
	Complete Remedial Investigation		Sep-2019			
UXO 25	**OU X - Ranch Road Rifle Range**					Major contaminants: metals in soil; Probable exit strategy: removal; Last milestone: EE/CA- 11/12; NORM RC Date: 5/31/18
	Refer to Stump Neck MRP Small Arms Ranges below					
UXO 26	**OU X - The Valley Impact Area**					Major contaminants: MPPEH in soil; Probable exit strategy: removal & LUCs; Last milestone: Final SI Report- 9/10; NORM RC Date: 10/30/20
	Complete Remedial Investigation		Sep-2016			
UXO 27	**OU X - Sonar Training Area**					Major contaminants: MPPEH/water site; Probable exit strategy: removal & LUCs; Last milestone: Final SI Report- 9/10; NORM RC Date: 7/28/21
	Complete Remedial Investigation		Sep-2017			
UXO 28	**OU X - EOD School Demo Area**					Major contaminants: MPPEH in soil; Probable exit strategy: removal & LUCs; Last milestone: Final SI Report- 9/10; NORM RC Date: 9/26/19
	Complete Remedial Investigation		Sep-2018			
UXO 30	**OU X - Gate 3 Burning Ground**					Major contaminants: MPPEH & MC in soil & GW; Probable exit strategy: removal & LUCs; Last milestone: Final SI Report- 9/10; NORM RC Date: 7/29/20
	Complete Remedial Investigation		Sep-2017			
UXO 31	**OU X - Pope's Creek**					Major contaminants: MPPEH/water site; Probable exit strategy: removal & LUCs; Last milestone: Final SI Report- 9/10; NORM RC Date: 9/26/21
	Complete Remedial Investigation		Sep-2018			
UXO 32	**OU X - Scrap Yard**					Major contaminants: Metals, PAHs, & dioxins in soil; Probable exit strategy: LUCs; Last milestone: Final Proposed Plan - 8/13; NORM RC Date: 6/16/14
	Complete RACR					
	Complete Final RACR		Nov-2014	Sep-2015		Draft RACR completed in August 2014
UXO 33	**OU X - Water Impact Area**					Major contaminants: MPPEH/water site; Probable exit strategy: removal & LUCs; Last milestone: Final SI Report- 9/10; NORM RC Date: 10/1/26
	Complete Remedial Investigation		Sep-2018			
Stump Neck MRP Small Arms Ranges	**OU X - UXO 14-Marine Rifle Range, UXO 15 Old Skeet & Trap Range, UXO 16-Rum Point Skeet Range, UXO 17-Small Arms (Pistol Range), UXO 25-Ranch Road Rifle Range**					Major contaminants: Metals in soil; Probable exit strategy: removal Last milestone: EE/CA- 11/12
	Complete Action Memorandum					Action Memo created but put on hold due to funding availability for the removal actions. Sites not funded until FY19
	Complete Final Action Memo		TBD			
	Complete Remedial Action					
	Award Removal Action		Dec-2019			
	Complete Removal Action		Dec-2020			
	Complete Closeout Document					
	Complete Draft Closeout Report		Jan-2021			
	Complete Final Closeout Report	60	Mar-2021			
	Complete Draft Decision Document		Mar-2021			Will be prepared after Closeout Report
	Complete Final Decision Document	30	Apr-2021			
Update MRSPP Rankings	**Complete MRSPP Rankings**					
	Complete Draft MRSPP		TBD			May be updated, as needed, depending on investigation results.
	Complete Public Notice		TBD			
	Complete Final MRSPP		TBD			

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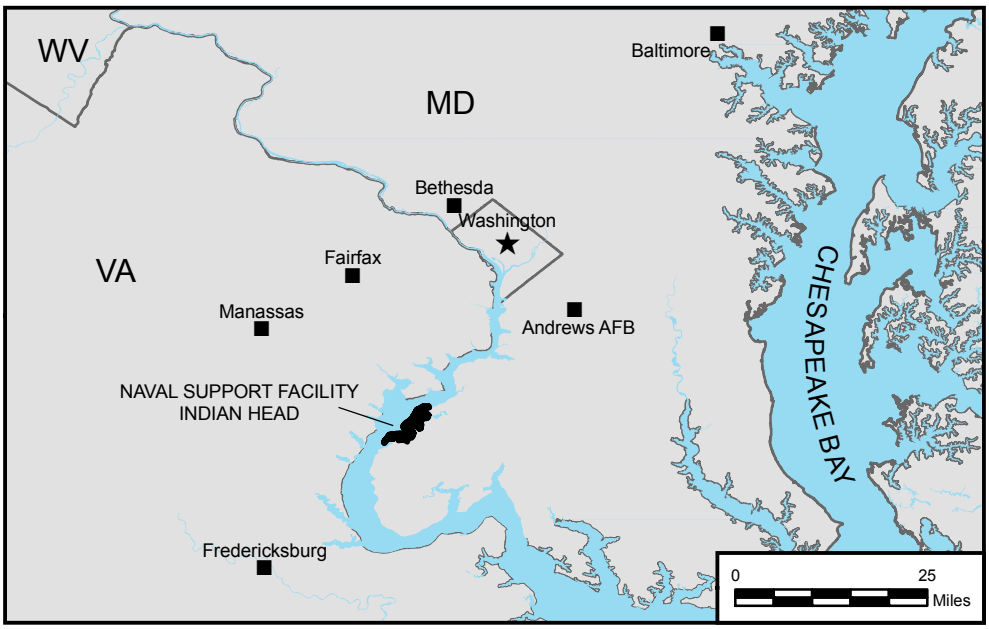
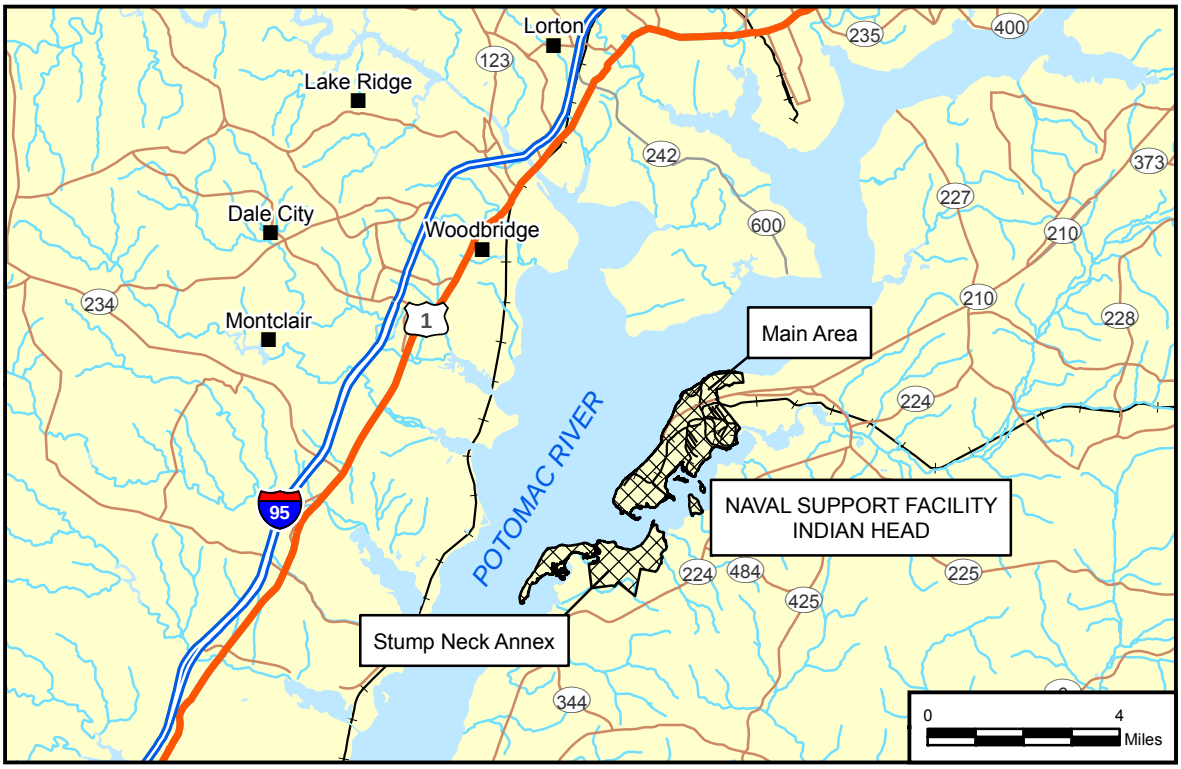


Legend

- City
- Limited Access
- Highway
- Major Road
- Local Road
- Rivers
- Railroads



DRAWN BY K. MOORE	DATE 03/20/09	TETRA TECH	CONTRACT NUMBER CTO JU14
CHECKED BY E. CORACK	DATE 06/20/11	FACILITY LOCATION MAP NAVAL SUPPORT FACILITY INDIAN HEAD INDIAN HEAD, MARYLAND	APPROVED BY E. CORACK DATE 06/20/11
DRAWN BY J. ENGLISH	DATE 06/21/11		APPROVED BY — DATE —
SCALE AS NOTED			FIGURE NO. FIGURE 1-1 REV 0

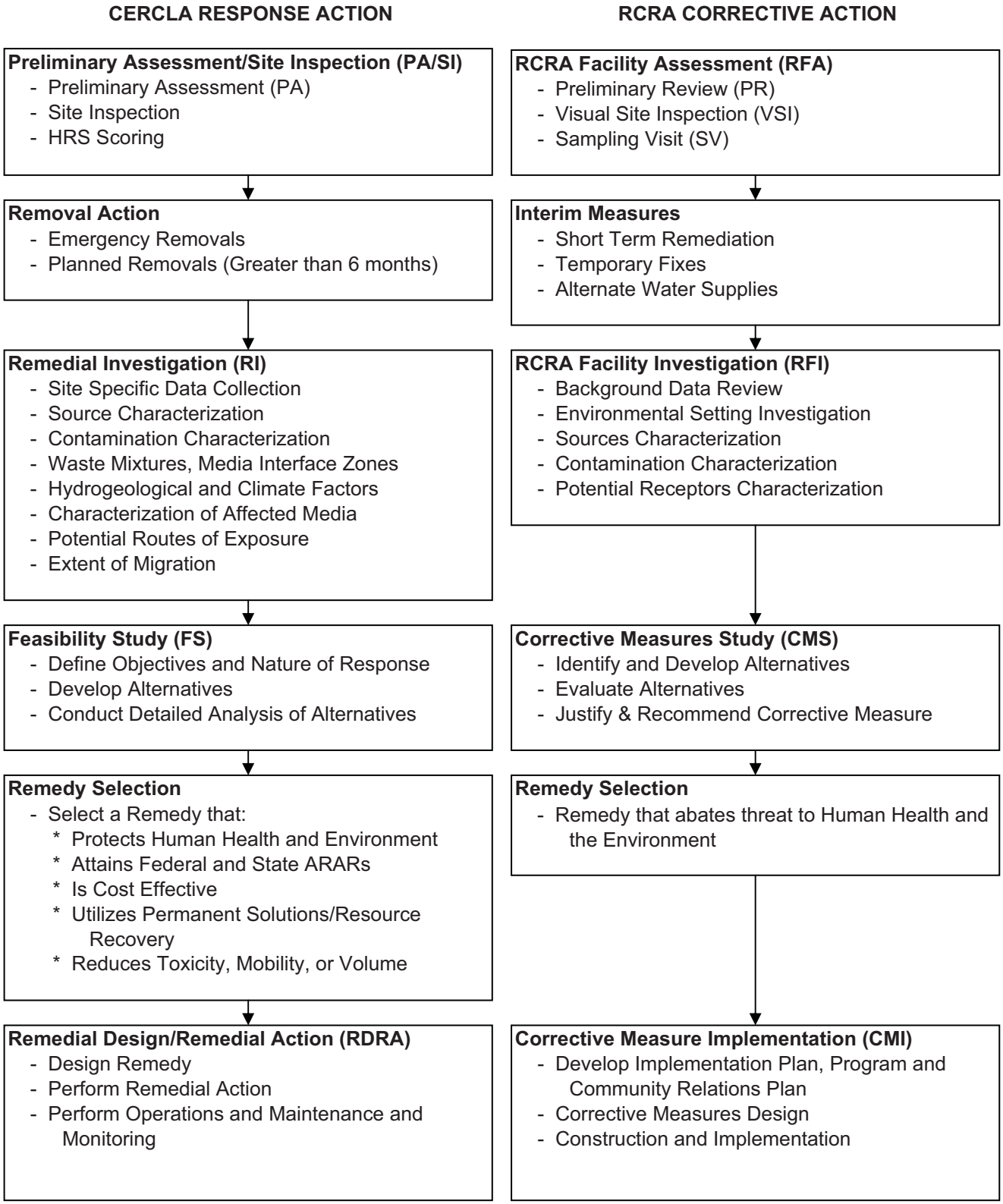
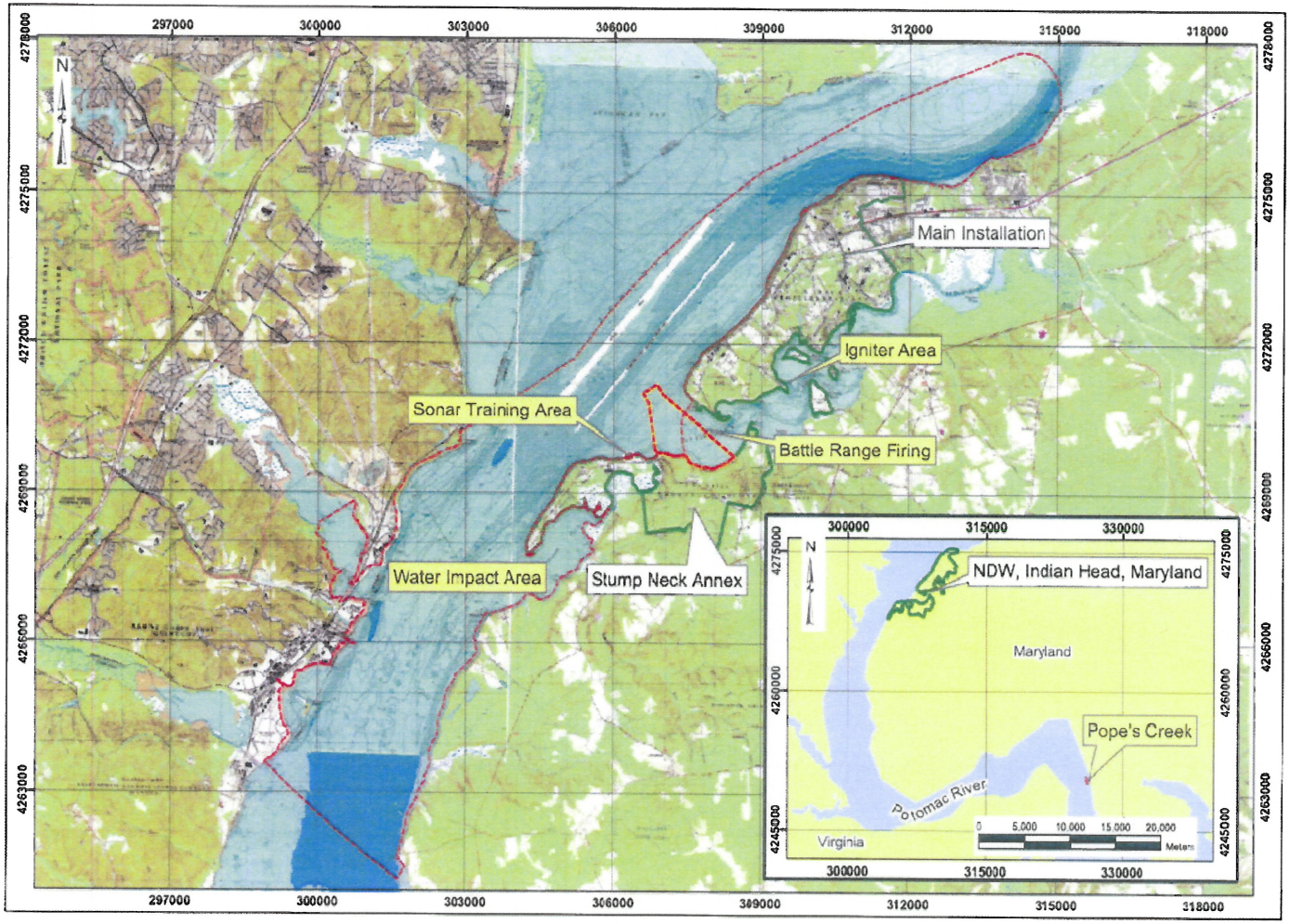


FIGURE 1-2
CERCLA PROCESS VS. RCRA PROCESS
NAVAL SUPPORT FACILITY INDIAN HEAD
INDIAN HEAD, MARYLAND



Water Area Munitions Study
NDW, Indian Head, Maryland

MALCOLM PIRNIE

Figure 1-3
Area Location Map

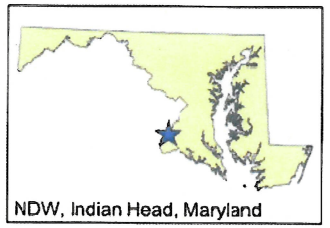
- Installation Boundary
- Sonar Training Area
- Battle Range Firing
- Water Impact Area
- Igniter Area
- Popes Creek

0 1,250 2,500 3,750 5,000 Meters

Data Source: USGS. 7.5 Minute Series
Topographic Survey - Bathymetric Map
Indian Head, MD-VA, 1981
Quantico, VA-MD, 1981

Coordinate System: UTM Zone 18N
Datum: NAD 83
Units: Meters

Contract: N62472-02-D-1300
Edition: Final Water Area Munitions Study
Date: February 2005



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Aerial photograph taken in 2009.

N

Main Area

Potomac River

Mattawoman Creek

Stump Neck Annex

33 18 27 15 37 3 14 16 4 64 32 14 28 35 12 23 5 62 1 34 36 38 30 17 26 63 65 30 10 2 21 25 26 33 60 31 7 22 58 59 61

Legend

- Site Boundary
- 12 IR Site Number
- 32 MRP UXO Number
- 14 SWMU Site Number
- Approximate Boundary of MRP UXO Site 26

NOTES
MRP Site UXO 33 is a water impact area associated with Main Area shown for reference.
MRP Site UXO 18 is a water impact area associated with Stump Neck Annex.

2,000 0 2,000 Feet

SWMU KEY

14 Photographic Lab Septic System
30 Building 2015 Dry Well

IR SITE KEY

30 Stump Neck Impact Area (Also UXO 10)
31 Old Demolition Range (Also UXO 7)
32 Suspected Tool Burial Site
33 Scrap Metal Pit
34 Tool Burial Site
35 Torpedo Burial Site (Also UXO 12)
36 Closed Landfill
37 Causeway (Also UXO 3)
38 Rum Point Landfill
58 Range 3 Burn Point
59 Chicamuxen Creek's Edge Site A
60 Chicamuxen Creek's Edge Site B
61 Range 6
62 Air Blast Pond (Also UXO 1)
63 Area 8 (Also UXO 2)
64 IED (Also UXO 4)
65 IOD (Also UXO 5)

MRP UXO KEY

1 Air Blast Pond (Also Site 62)
2 Area 8 (Also Site 63)
3 Causeway (Also Site 37)
4 IED (Also Site 64)
5 IOD (Also Site 65)
7 Old Demolition Range (Also Site 31)
10 Stump Neck Impact Area (Also Site 30)
12 Torpedo Burial Site (Also Site 35)
14 Marine Rifle Range
15 Old Skeet and Trap Range
16 Rum Point Skeet Range
17 Small Arms (Pistol) Range
18 Battle Range Firing Area
21 Test Area 1
22 Test Area 2
23 Torpedo Casing Disposal Area
25 Roach Road Rifle Range
26 The Valley Impact Area
27 Sonar Training Area
28 EOD School Demo Area

DRAWN BY / DATE	J. ENGLISH / 06/24/11
CHECKED BY / DATE	E. CORACK / 06/30/11
REVISED BY / DATE	___ / ___
SCALE	AS NOTED

NAVFAC

SITE LOCATION MAP
STUMP NECK ANNEX
NAVAL SUPPORT FACILITY INDIAN HEAD
INDIAN HEAD, MARTLAND

CONTRACT NUMBER	3448
CTO NUMBER	___
APPROVED BY / DATE	___ / ___
APPROVED BY / DATE	___ / ___
FIGURE NO.	FIGURE 3-2
REV	1

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POTOMAC RIVER

MATTAWOMAN CREEK

Main Area

Marsh Island

Thouroughfare Island

Bullit's Neck

Stump Neck Annex

33

29 11 2 4 9 10 9 AOC 31 55 50 16 15 54 53 14 49 13 1 28 20 69 30 47 46 8 56 45 44 3 7 57 67 24 27 32 39 40 26 70 41 19 25 23 12 48 18 21 43 29 13 22 6 66 5 38 17 6 42 11 21 20

IR SITE KEY

1 Thorium Spill
2 Waste Crank Case Oil Applied to Torrence Road
3 Nitroglycerin Explosion, Nitration Building Area
4 Lloyd Road Oil Spill Sites
5 X-Ray Building 731
6 Building 1349, Hypo Spill
7 HMX Spill, Slurry Mix Building 682
8 Mercury Contamination from Building 766
9 Patterson Avenue, Oil Spill
11 Caffee Road Landfill
12 Town Gut Landfill
13 Paint Solvents Disposal Dumping Ground
14 Waste Acid Disposal Pit
15 Mercury Deposits in Manhole, Fluorine Lab
16 Laboratory Chemical Disposal
17 Disposed Metal Parts Along Shoreline
18 Hog Island
19 Catch Basin at Chip Collection House (1051)
19 Catch Basin at Chip Collection House (785)
20 Single-based Powder Facility
21 Bronson Road Landfill
23 Hydraulic Oil Spill Discharges from Extrusion Plant
24 Abandoned Drain Lines
25 Hypo Discharge X-Ray Building No.2
26 Thermal Destructor 2
27 Thermal Destructor 1
28 Original Burning Ground
AOC 31 Building 259 (Storehouse / Detonator Production)
39 Silver and Palladium Catalyst in Sediment
40 Silver and Palladium Catalyst in Sediment
41 Scrap Yard
42 Olsen Road Landfill
43 Toluene Disposal Site
44 Soak Out Area
45 Abandoned Drums
46 Cadmium Sandblast Grit
47 Mercuric Nitrate Disposal Area
48 Nitroglycerine Plant Disposal Area
49 Chemical Disposal Pit
50 Building 103, Crawl Space
53 Mercury Contamination of the Sewage System
54 Building 101, Dry Well/Building 101
55 Building 102, Dry Well/Building 102
56 IW87 - Lead Contamination
57 TCE Building 292 Area
66 Turkey Run Disposal Area
67 Hog-Out Facility
69 Building 1018 (Oxidizer Process Building)
70 Groundwater Contamination Along Water Works Way

SWMU KEY

21 Caffee Road Decontamination Burn Point
38 Caffee Road Waste Oil Storage Area

MRP UXO KEY

6 NG Slums Burning Site (also IR Site 22)
8 Original Burning Ground (also IR Site 28)
9 Single-base Propellant Grains Spill (also IR Site 10)
11 The Valley (also IR Site 29)
13 FDR Skeet Range
20 Safety Thermal Treatment Point
29 Southwestern Pistol Range
30 Gate 3 Burning Ground
32 Scrap Yard (also IR Site 41)
33 Water Impact Area

Legend

6 IR Site Number
20 MRP UXO Number
21 SWMU Number
Site Boundary

0 1,000 2,000 4,000 Feet

TETRA TECH

SITE LOCATION MAP
MAIN AREA
NAVAL SUPPORT FACILITY INDIAN HEAD
INDIAN HEAD, MARYLAND

FILE	112G03448	SCALE	AS NOTED
FIGURE NO.	FIGURE 3-1	REV	DATE 9/4/13

APPENDIX A

NSFIH – Main Area Site Figures

TABLE A-1
FIGURE INDEX
INSTALLATION RESTORATION (IR) PROGRAM SITES
MAIN AREA
NSFIH, INDIAN HEAD, MARYLAND

IR Site ID	AOC / SWMU ID	MRP UXO ID	Name of IR Site	Figure No.
NA			IR Sites, Main Area	A-1
1			Thorium Spill	A-2
2			Waste Crank Case Oil Applied to Torrence Road	A-3
3			Nitroglycerin Explosion, Nitration Building Area	A-4
4			Lloyd Road Oil Spill Sites	A-5
5			X-Ray Building 731	A-6
6			Building 1349, Hypo Spill, Radiographic Facility Accelerator	A-7
7			Building 682, HMX Spill	A-4
8			Building 766, Mercury Deposits	A-8
9			Patterson Avenue, Oil Spill	A-5
10		9	Single-base Propellant Grains Spill	A-9
11			Caffee Road Landfill	A-10
12			Town Gut Landfill	A-11
13			Paint Solvents Disposal Ground	A-12
14			Waste Acid Disposal Pit	A-13
15			Mercury Deposits in Manhole, Fluorine Lab	A-13
16			Laboratory Chemical Disposal	A-13
17			Disposed Metal Parts Along Shoreline	A-14
18			Hog Island	A-15
19			Catch Basins at Chip Collection Houses	A-16
20			Single-base Powder Facilities	A-17
21			Bronson Road Landfill	A-15
22		6	NG Slums Burning Site	A-18
23			Hydraulic Oil Spill Discharges From Extrusion Plant	A-19
24			Abandoned Drain Lines	A-17
25			Hypo Discharge X-Ray Building No. 2	A-20
26			Thermal Destructor 2	A-21
27			Thermal Destructor 1	A-22
28		8	Original Burning Ground	A-23
29		11	The Valley	A-3

IR Site ID	AOC / SWMU ID	MRP UXO ID	Name of IR Site	Figure No.
39			Silver Release to Sediments	A-24
40			Palladium Catalyst in Sediments	A-24
41		32	Scrap Yard	A-22
42			Olsen Road Landfill	A-6
43			Toluene Disposal Site	A-25
44			Soak Out Area	A-26
45			Abandoned Drums	A-26
46			Cadmium Sandblast Grit	A-27
47			Mercuric Nitrate Disposal Area	A-27
48			Nitroglycerin Plant Disposal Area	A-8
49			Chemical Disposal Pit	A-13
50			Building 103, Crawl Space	A-13
51			Building 101, Dry Well	A-13
52			Building 102, Dry Well	A-13
53			Mercury Contamination of the Sewage System	A-13
54			Building 101	A-13
55			Building 102	A-13
56			IW87 - Lead Contamination	A-8
57			TCE Building 292 Area	A-17
66			Turkey Run Disposal Area	A-28
67			Hog Out Facility	A-29
	20	20	Safety Thermal Treatment Point	A-31
		13	FDR Skeet Range	A-30
		19	Igniter Area - (Water Site)	none
		29	Southwestern Pistol Range	A-32
		30	Gate 3 Burning Ground	A-33
		31	Pope's Creek (Water Site)	none
		33	Water Impact Area - (Water Site)	none
69			Building 1018 (Oxidizer Process Building)	A-34
	31		AOC 31 - Building 259 (Old Storehouse / Detonator Production)	A-35
70			Scrap Yard Groundwater	A-36

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POTOMAC RIVER

MATTAWOMAN CREEK

Main Area

Marsh Island

Thouroughfare Island

Bullit's Neck

Stump Neck Annex

29 11 2 4 9 33 AOC 31 10 9 55 50 16 15 54 53 14 49 1 69 30 47 46 8 56 45 44 3 7 48 13 18 21 12 23 25 19 39 40 26 70 41 32 27 24 67 57 20 28 43 29 5 66 22 6 38 17 11 42 6 21 20

IR SITE KEY

1 Thorium Spill
2 Waste Crank Case Oil Applied to Torrence Road
3 Nitroglycerin Explosion, Nitration Building Area
4 Lloyd Road Oil Spill Sites
5 X-Ray Building 731
6 Building 1349, Hypo Spill
7 HMX Spill, Slurry Mix Building 682
8 Mercury Contamination from Building 766
9 Patterson Avenue, Oil Spill
11 Caffee Road Landfill
12 Town Gut Landfill
13 Paint Solvents Disposal Dumping Ground
14 Waste Acid Disposal Pit
15 Mercury Deposits in Manhole, Fluorine Lab
16 Laboratory Chemical Disposal
17 Disposed Metal Parts Along Shoreline
18 Hog Island
19 Catch Basin at Chip Collection House (1051)
19 Catch Basin at Chip Collection House (785)
20 Single-based Powder Facility
21 Bronson Road Landfill
23 Hydraulic Oil Spill Discharges from Extrusion Plant
24 Abandoned Drain Lines
25 Hypo Discharge X-Ray Building No.2
26 Thermal Destructor 2
27 Thermal Destructor 1
28 Original Burning Ground
AOC 31 Building 259 (Storehouse / Detonator Production)
39 Silver and Palladium Catalyst in Sediment
40 Silver and Palladium Catalyst in Sediment
41 Scrap Yard
42 Olsen Road Landfill
43 Toluene Disposal Site
44 Soak Out Area
45 Abandoned Drums
46 Cadmium Sandblast Grit
47 Mercuric Nitrate Disposal Area
48 Nitroglycerine Plant Disposal Area
49 Chemical Disposal Pit
50 Building 103, Crawl Space
53 Mercury Contamination of the Sewage System
54 Building 101, Dry Well/Building 101
55 Building 102, Dry Well/Building 102
56 IW87 - Lead Contamination
57 TCE Building 292 Area
66 Turkey Run Disposal Area
67 Hog-Out Facility
69 Building 1018 (Oxidizer Process Building)
70 Groundwater Contamination Along Water Works Way

SWMU KEY

21 Caffee Road Decontamination Burn Point
38 Caffee Road Waste Oil Storage Area

MRP UXO KEY

6 NG Slums Burning Site (also IR Site 22)
8 Original Burning Ground (also IR Site 28)
9 Single-base Propellant Grains Spill (also IR Site 10)
11 The Valley (also IR Site 29)
13 FDR Skeet Range
20 Safety Thermal Treatment Point
29 Southwestern Pistol Range
30 Gate 3 Burning Ground
32 Scrap Yard (also IR Site 41)
33 Water Impact Area

Legend

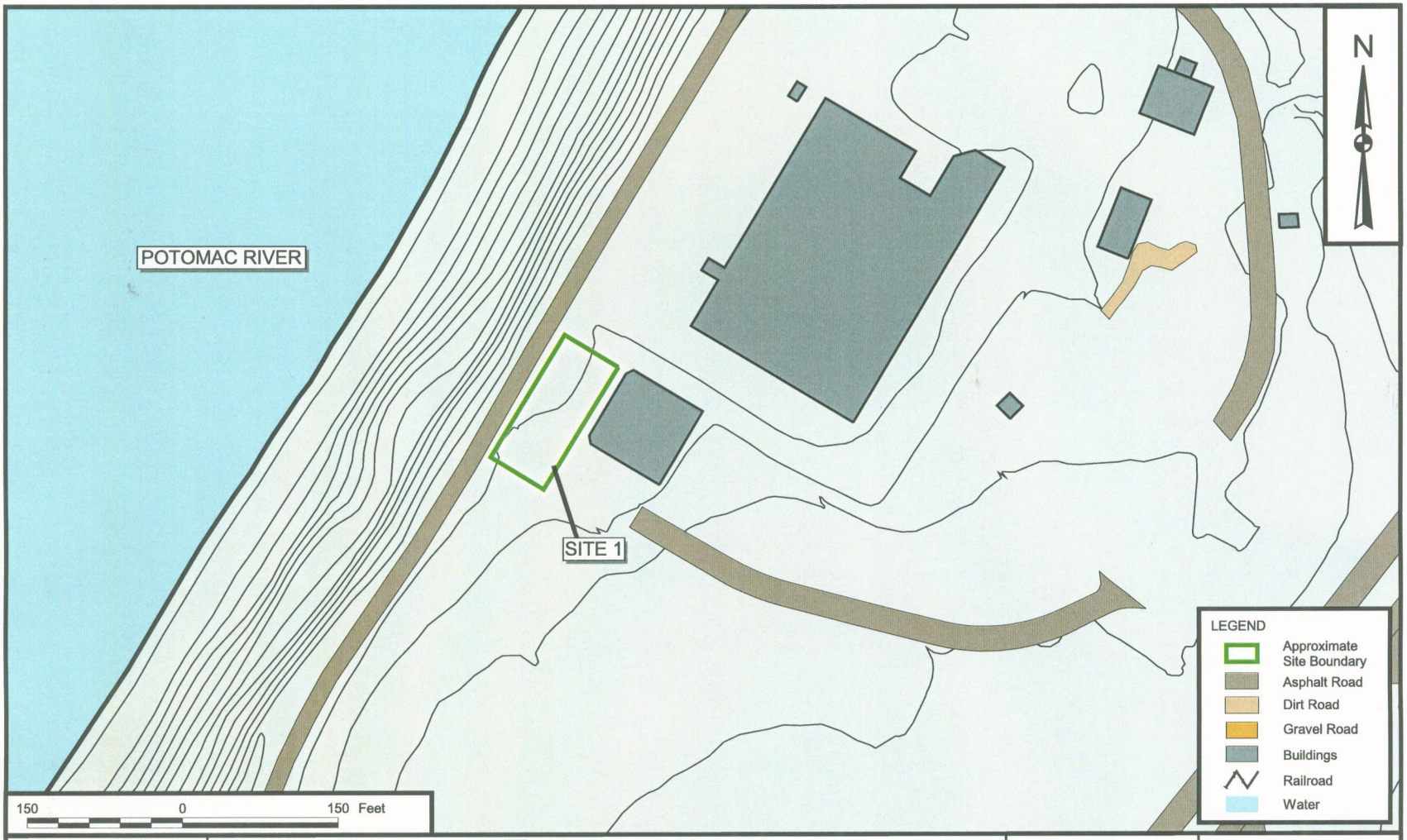
6 IR Site Number
20 MRP UXO Number
21 SWMU Number
Site Boundary

0 1,000 2,000 4,000 Feet

TETRA TECH

SITE LOCATION MAP
MAIN AREA
NAVAL SUPPORT FACILITY INDIAN HEAD
INDIAN HEAD, MARYLAND

FILE	112G03448	SCALE	AS NOTED
FIGURE NO.	**FIGURE A-1**	REV / DATE	9/4/13



DRAWN BY: K. PEILA — DATE: 8/7/02	Tetra Tech NUS, Inc.	CONTRACT NUMBER: 2193	OWNER NUMBER: —
CHECKED BY: GJL — DATE: 12/29/06	SITE 1 - THORIUM SPILL MAIN AREA NAVAL SUPPORT FACILITY, INDIAN HEAD INDIAN HEAD, MARYLAND	APPROVED BY: GJL — DATE: 12/29/06	
COST/SCHEDULE-AREA		APPROVED BY: — — DATE: —	
SCALE: AS NOTED		DRAWING NO.: FIGURE A-2	REV: 0

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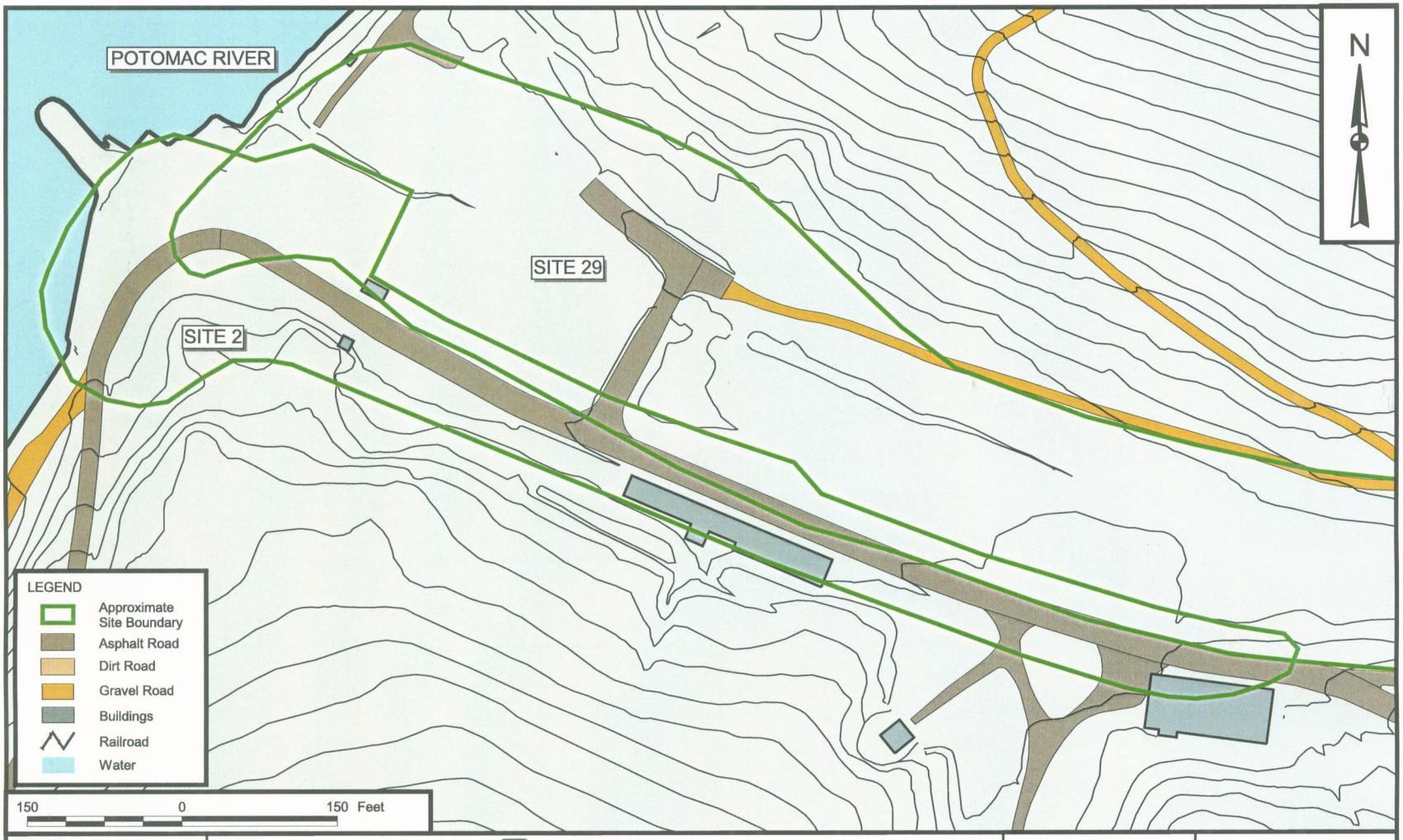

DRAWN BY: K. PEILA — DATE: 8/7/02	Tetra Tech NUS, Inc.	CONTRACT NUMBER: 4020	OWNER NUMBER: —
CHECKED BY: GJL — DATE: 8/7/02	SITE 2 - WASTE CRANK CASE OIL APPLIED TO TORRENCE ROAD AND SITE 29 - THE VALLEY MAIN AREA NAVAL DISTRICT WASHINGTON, INDIAN HEAD INDIAN HEAD, MARYLAND	APPROVED BY: GJL — DATE: 6/27/05	
COST/SCHEDULE-AREA		APPROVED BY: — — DATE: —	
SCALE: AS NOTED		DRAWING NO.: FIGURE A-3	REV: 0

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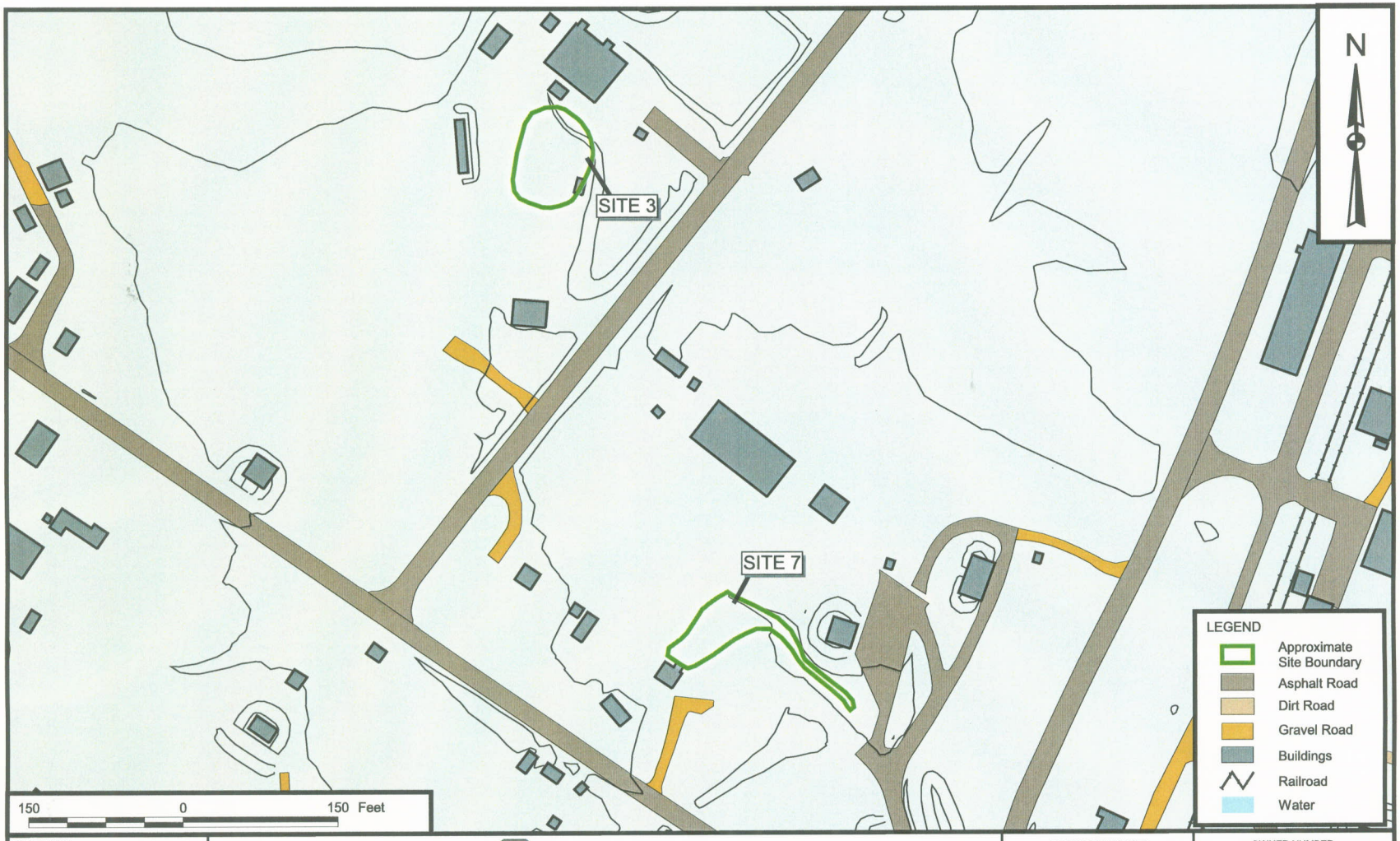

DRAWN BY: K. PEILA — DATE: 8/7/02	Tetra Tech NUS, Inc.	CONTRACT NUMBER: 2193	OWNER NUMBER: —
CHECKED BY: GJL — DATE: 12/29/06	SITE 3 - NITRATION BUILDING AREA AND SITE 7 - HMX SPILL, SLURRY MIX BUILDING 682 MAIN AREA NAVAL SUPPORT FACILITY, INDIAN HEAD INDIAN HEAD, MARYLAND	APPROVED BY: GJL — DATE: 12/29/06	
COST/SCHEDULE-AREA		APPROVED BY: — — DATE: —	
SCALE: AS NOTED		DRAWING NO.: FIGURE A-4	REV: 0

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DRAWN BY: K. PEILA — DATE: 8/7/02	Tetra Tech NUS, Inc.	CONTRACT NUMBER: 2193	OWNER NUMBER: —
CHECKED BY: GJL — DATE: 12/29/06	SITE 4 - LLOYD ROAD OIL SPILL SITES AND SITE 9 - PATTERSON AVENUE OIL SPILL MAIN AREA NAVAL SUPPORT FACILITY, INDIAN HEAD INDIAN HEAD, MARYLAND	APPROVED BY: GJL — DATE: 12/29/06	
COST/SCHEDULE-AREA		APPROVED BY: — — DATE: —	
SCALE: AS NOTED		DRAWING NO.: FIGURE A-5	REV: 0

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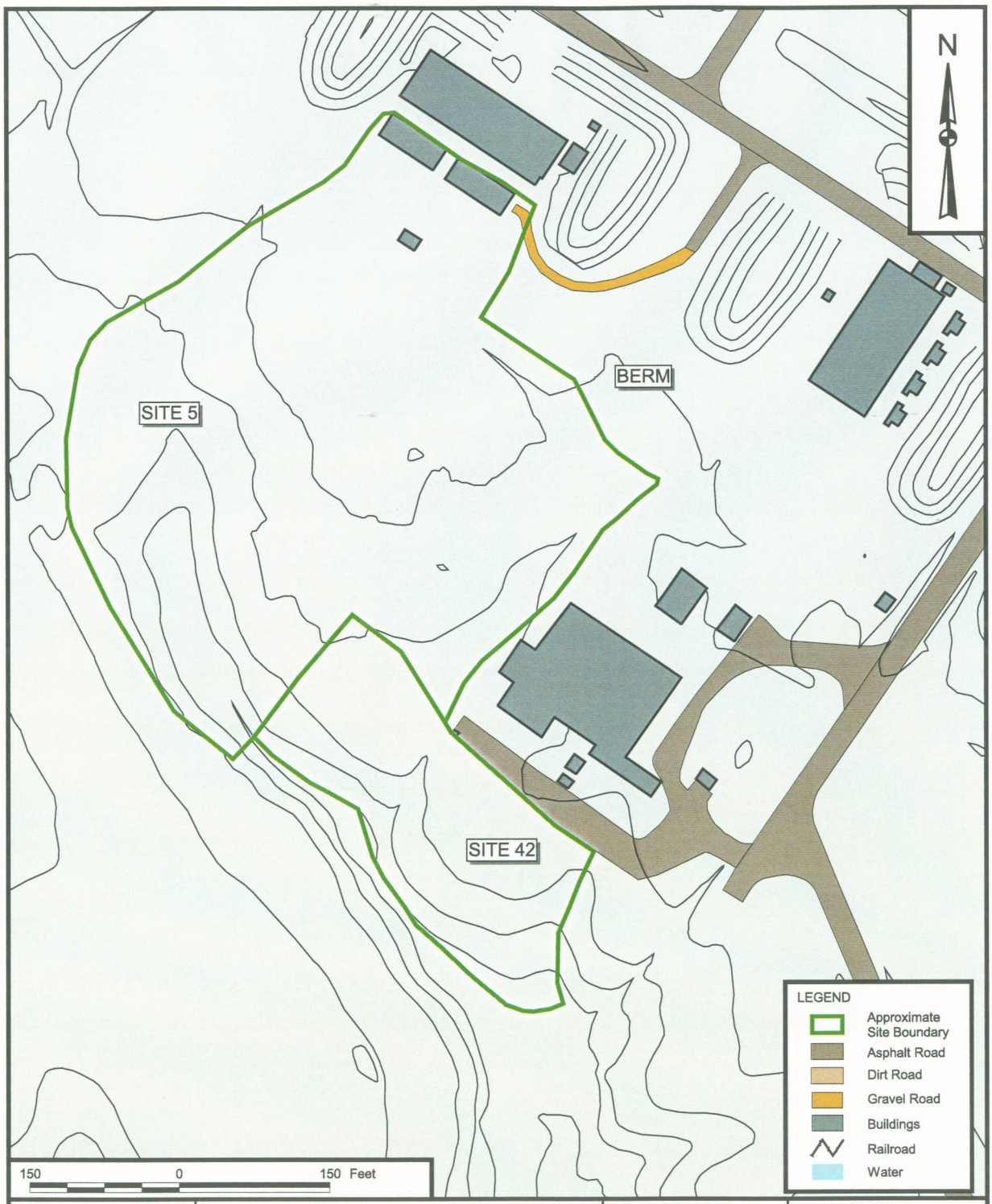

DRAWN BY: K. PEILA — DATE: 8/7/02	Tetra Tech NUS, Inc.	CONTRACT NUMBER: 2193	OWNER NO.: —
CHECKED BY: GJL — DATE: 12/29/06	SITE 5 - X-RAY BUILDING 731 AND SITE 42 - OLSEN ROAD LANDFILL MAIN AREA NAVAL SUPPORT FACILITY, INDIAN HEAD INDIAN HEAD, MARYLAND	APPROVED BY: GJL — DATE: 12/29/06	
COST/SCHEDULE-AREA		APPROVED BY: — — DATE: —	
SCALE: AS NOTED		DRAWING NO.: FIGURE A-6	REV: 0

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DRAWN BY: K. PEILA — DATE: 8/7/02	Tetra Tech NUS, Inc.	CONTRACT NUMBER: 2193	OWNER NUMBER: —
CHECKED BY: GJL — DATE: 12/29/06	SITE 6 - HYPO SPILL, RADIOGRAPHIC FACILITY ACCELERATOR MAIN AREA NAVAL SUPPORT FACILITY, INDIAN HEAD INDIAN HEAD, MARYLAND	APPROVED BY: GJL — DATE: 12/29/06	
COST/SCHEDULE-AREA		APPROVED BY: — — DATE: —	
SCALE: AS NOTED		DRAWING NO.: FIGURE A-7	REV: 0

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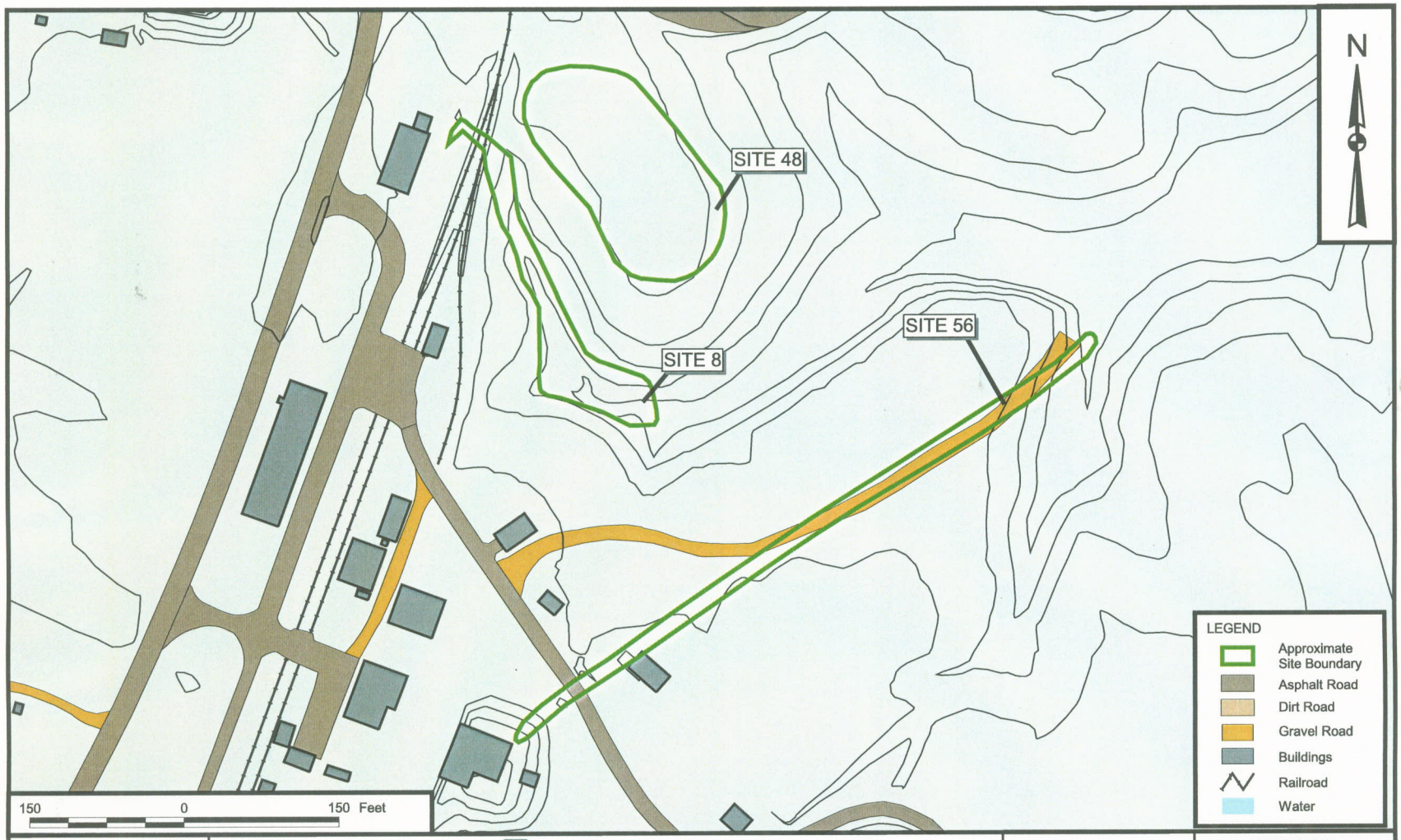

DRAWN BY: K. PEILA — DATE: 8/7/02	Tetra Tech NUS, Inc.	CONTRACT NUMBER: 2193	OWNER NUMBER: —
CHECKED BY: GJL — DATE: 12/29/06	SITE 8 - MERCURY CONTAMINATION FROM BUILDING 766, SITE 48 - NITROGLYCERIN PLANT DISPOSAL AREA AND SITE 56 - LEAD CONTAMINATION AT IW OUTFALL 87 MAIN AREA NAVAL SUPPORT FACILITY, INDIAN HEAD INDIAN HEAD, MARYLAND	APPROVED BY: GJL — DATE: 12/29/06	
COST/SCHEDULE-AREA		APPROVED BY: — — DATE: —	
SCALE: AS NOTED		DRAWING NO.: FIGURE A-8	REV: 0

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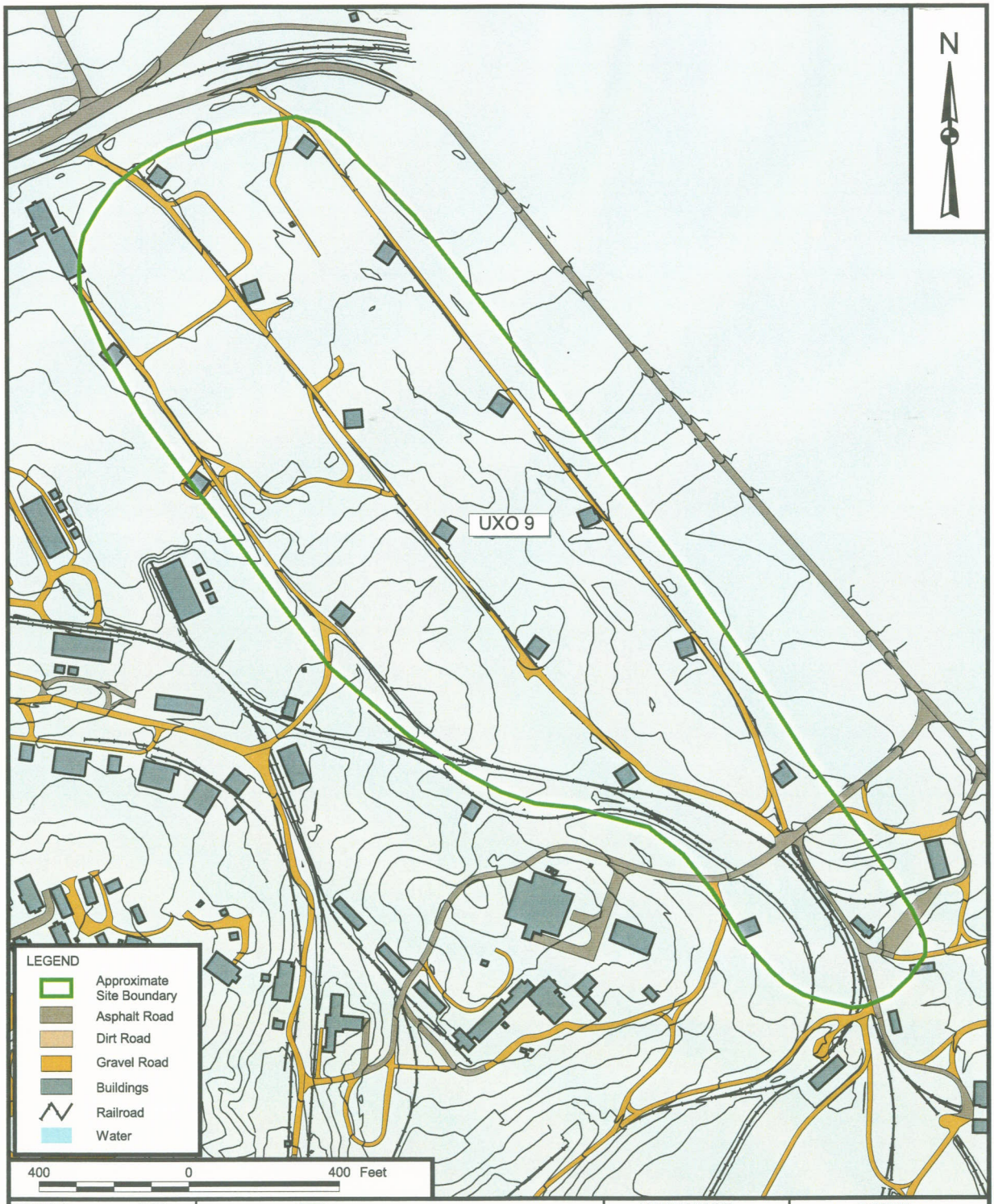

DRAWN BY: K. PEILA — DATE: 8/7/02	Tetra Tech NUS, Inc.	CONTRACT NUMBER: 2193	OWNER NO.: —
CHECKED BY: GJL — DATE: 12/29/06	UXO 9 - SINGLE-BASE PROPELLANT GRAINS SPILL AREA MAIN AREA NAVAL SUPPORT FACILITY, INDIAN HEAD INDIAN HEAD, MARYLAND	APPROVED BY: GJL — DATE: 12/29/06	
COST/SCHEDULE-AREA		APPROVED BY: — — DATE: —	
SCALE: AS NOTED		DRAWING NO.: FIGURE A-9	REV: 0

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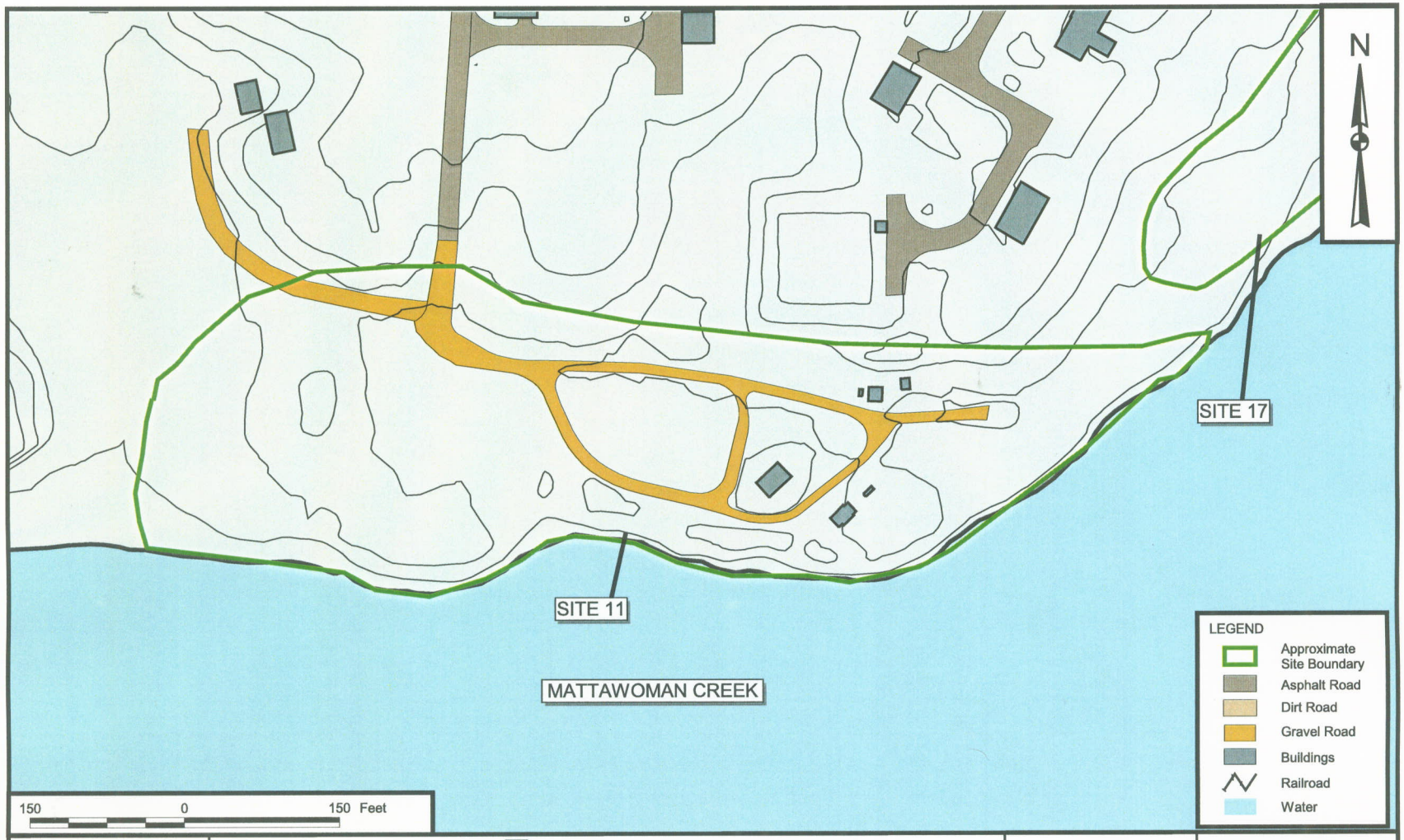

DRAWN BY: K. PEILA — DATE: 8/7/02	Tetra Tech NUS, Inc.	CONTRACT NUMBER: 2193	OWNER NUMBER: —
CHECKED BY: GJL — DATE: 12/29/06	SITE 11 - CAFFEE ROAD LANDFILL MAIN AREA NAVAL SUPPORT FACILITY, INDIAN HEAD INDIAN HEAD, MARYLAND	APPROVED BY: GJL — DATE: 12/29/06	
COST/SCHEDULE-AREA		APPROVED BY: — — DATE: —	
SCALE: AS NOTED		DRAWING NO.: FIGURE A-10	REV: 0

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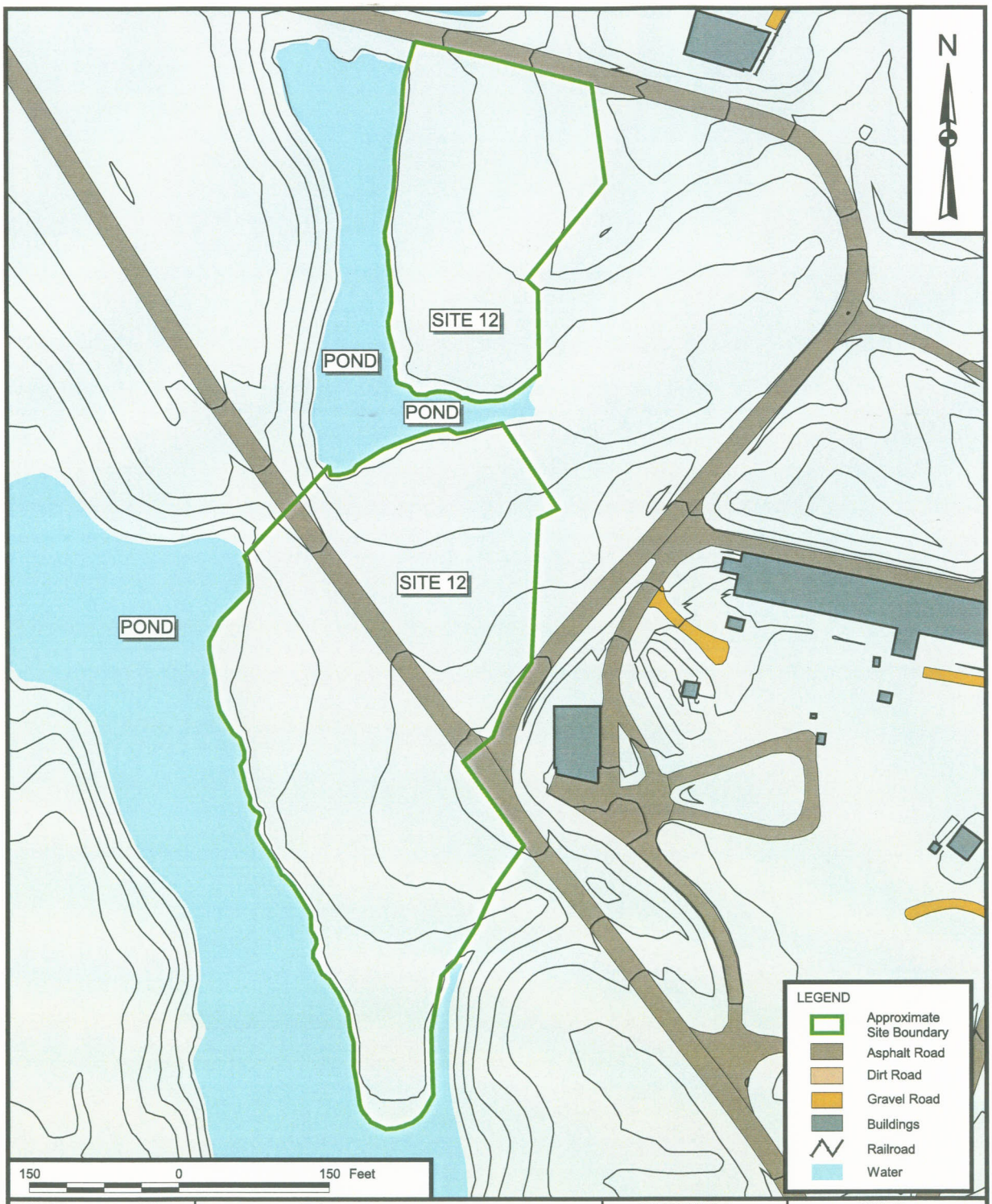

DRAWN BY: K. PEILA — DATE: 8/7/02	Tetra Tech NUS, Inc.	CONTRACT NUMBER: 2193	OWNER NO.: —
CHECKED BY: GJL — DATE: 12/29/06	SITE 12 - TOWN GUT LANDFILL MAIN AREA NAVAL SUPPORT FACILITY, INDIAN HEAD INDIAN HEAD, MARYLAND	APPROVED BY: GJL — DATE: 12/29/06	
COST/SCHEDULE-AREA		APPROVED BY: — — DATE: —	
SCALE: AS NOTED		DRAWING NO.: FIGURE A-11	REV: 0

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DRAWN BY: K. PEILA — DATE: 8/7/02	Tetra Tech NUS, Inc.	CONTRACT NUMBER: 2193	OWNER NUMBER: —
CHECKED BY: GJL — DATE: 12/29/06	SITE 13 - PAINT SOLVENTS DISPOSAL GROUND MAIN AREA NAVAL SUPPORT FACILITY, INDIAN HEAD INDIAN HEAD, MARYLAND	APPROVED BY: GJL — DATE: 12/29/06	
COST/SCHEDULE-AREA		APPROVED BY: — — DATE: —	
SCALE: AS NOTED		DRAWING NO.: FIGURE A-12	REV: 0

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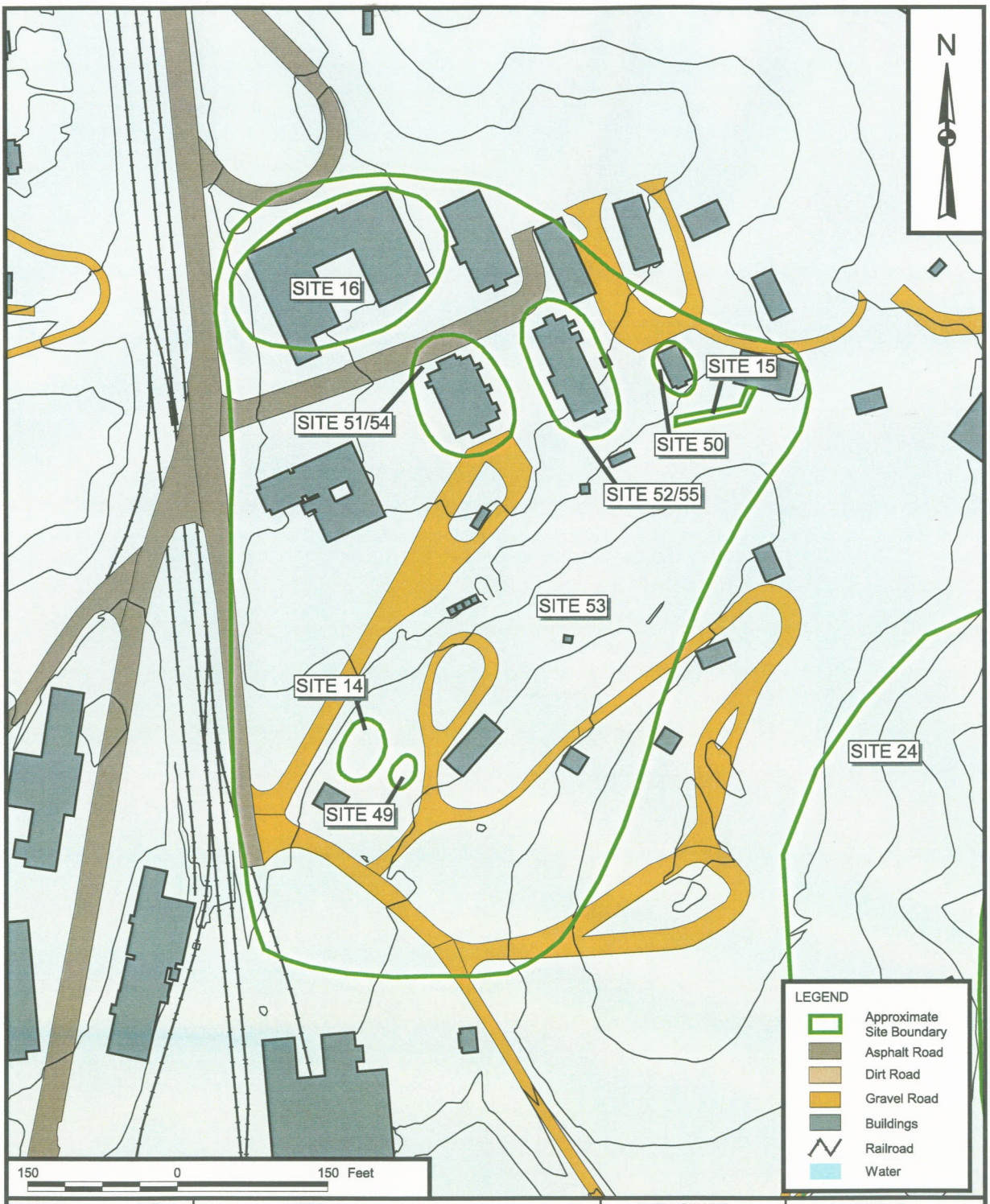

DRAWN BY: K. PEILA — DATE: 8/7/02	Tetra Tech NUS, Inc.	CONTRACT NUMBER: 2193	OWNER NO.: —
CHECKED BY: GJL — DATE: 12/29/06	SITES 14, 15, 16, 49, 50, 51/54, 52/55 AND 53 MAIN AREA NAVAL SUPPORT FACILITY, INDIAN HEAD INDIAN HEAD, MARYLAND	APPROVED BY: GJL — DATE: 12/29/06	
COST/SCHEDULE-AREA		APPROVED BY: — — DATE: —	
SCALE: AS NOTED		DRAWING NO.: FIGURE A-13	REV: 0

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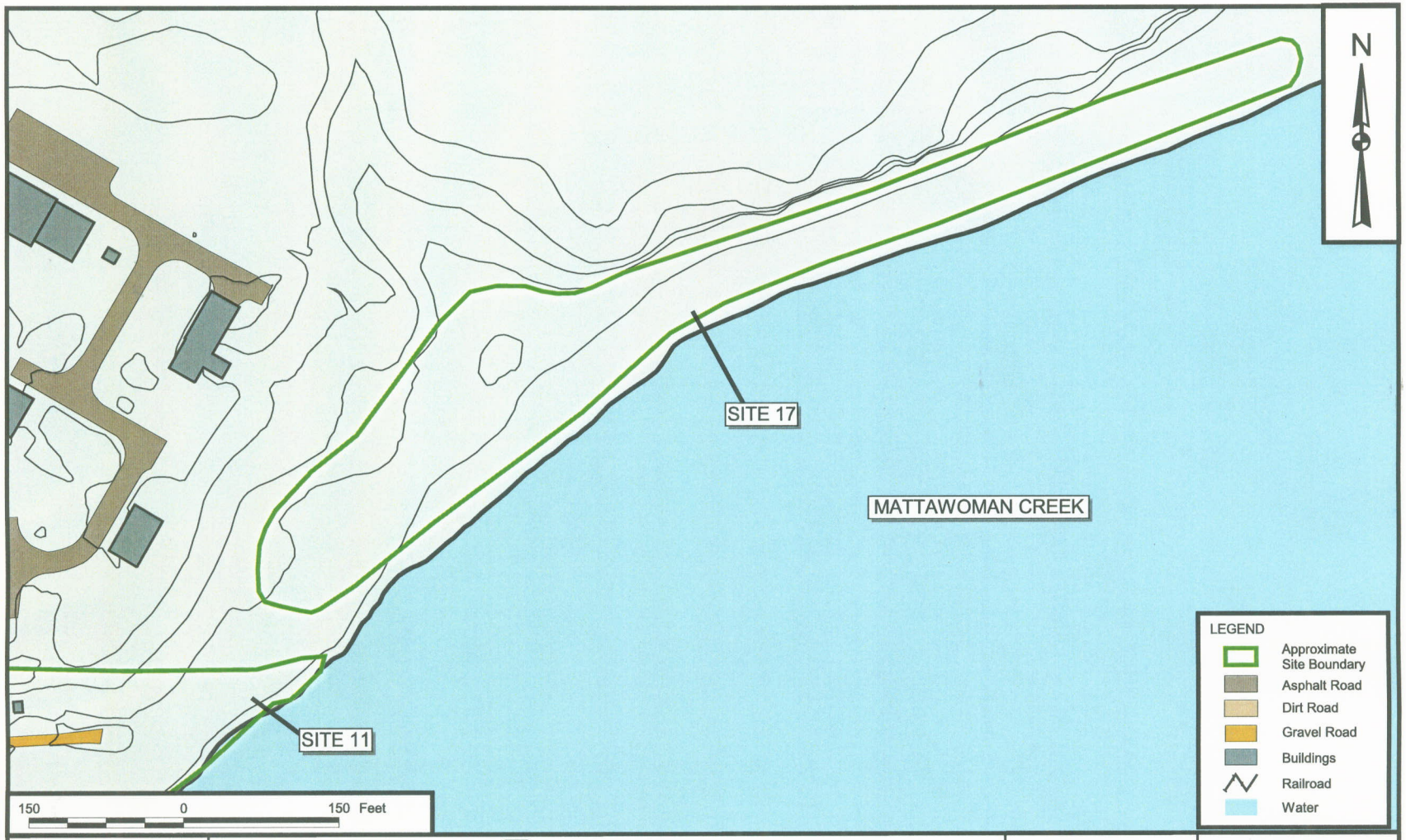

DRAWN BY: K. PEILA — DATE: 8/7/02	Tetra Tech NUS, Inc.	CONTRACT NUMBER: 2193	OWNER NUMBER: —
CHECKED BY: GJL — DATE: 12/29/06	SITE 17 - DISPOSED METAL PARTS ALONG SHORELINE MAIN AREA NAVAL SUPPORT FACILITY, INDIAN HEAD INDIAN HEAD, MARYLAND	APPROVED BY: GJL — DATE: 12/29/06	
COST/SCHEDULE-AREA		APPROVED BY: — — DATE: —	
SCALE: AS NOTED		DRAWING NO.: FIGURE A-14	REV: 0

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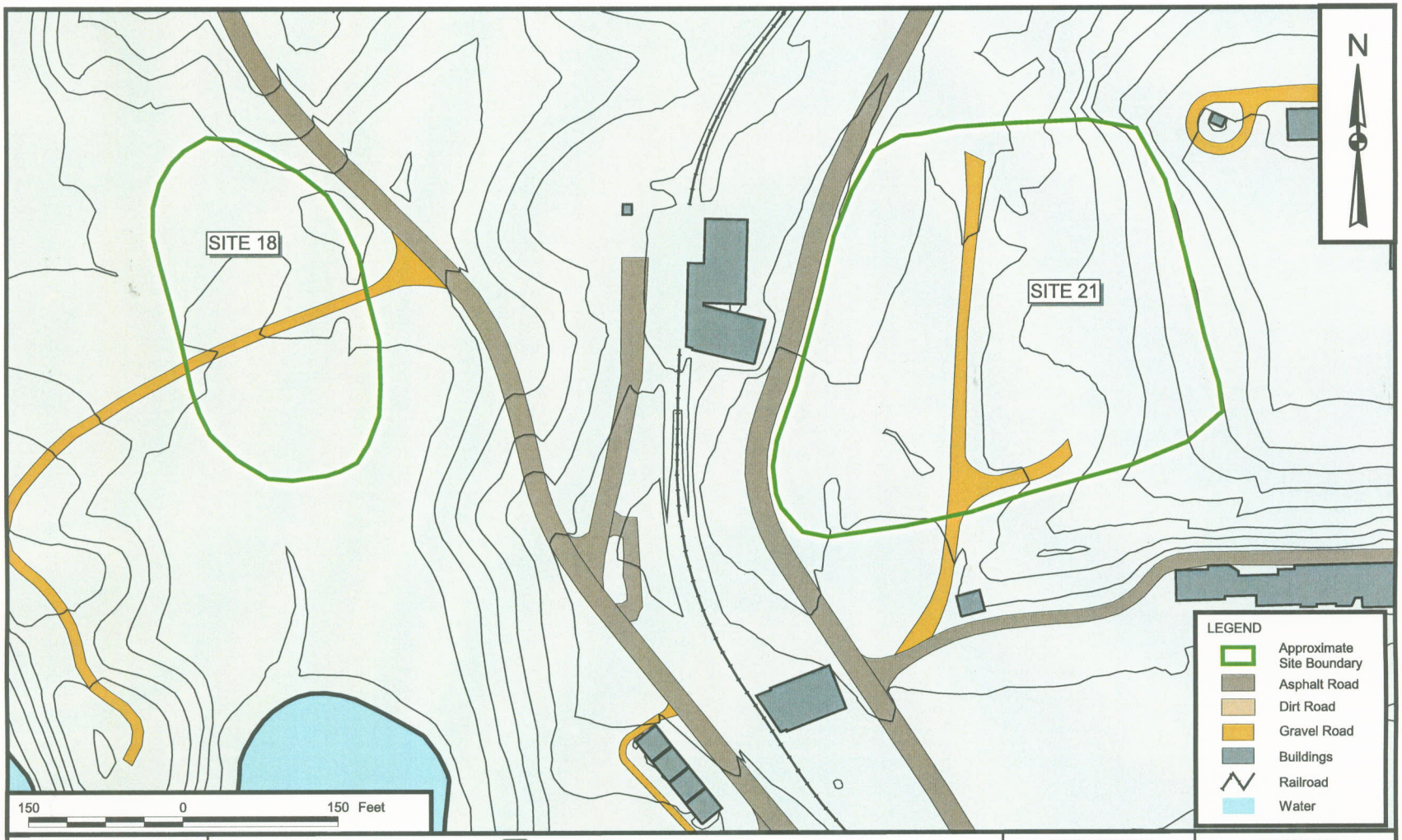

DRAWN BY: K. PEILA — DATE: 8/7/02	Tetra Tech NUS, Inc.	CONTRACT NUMBER: 2193	OWNER NUMBER: —
CHECKED BY: GJL — DATE: 12/29/06	SITE 18 - HOG ISLAND AND SITE 21 - BRONSON ROAD LANDFILL MAIN AREA NAVAL SUPPORT FACILITY, INDIAN HEAD INDIAN HEAD, MARYLAND	APPROVED BY: GJL — DATE: 12/29/06	
COST/SCHEDULE-AREA		APPROVED BY: — — DATE: —	
SCALE: AS NOTED		DRAWING NO.: FIGURE A-15	REV: 0

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DRAWN BY: K. PEILA — DATE: 8/7/02	Tetra Tech NUS, Inc.	CONTRACT NUMBER: 2193	OWNER NUMBER: —
CHECKED BY: GJL — DATE: 12/29/06	SITE 19 - CATCH BASINS AT CHIP COLLECTION HOUSES (1051) MAIN AREA NAVAL SUPPORT FACILITY, INDIAN HEAD INDIAN HEAD, MARYLAND	APPROVED BY: GJL — DATE: 12/29/06	
COST/SCHEDULE-AREA		APPROVED BY: — — DATE: —	
SCALE: AS NOTED		DRAWING NO.: FIGURE A-16	REV: 0

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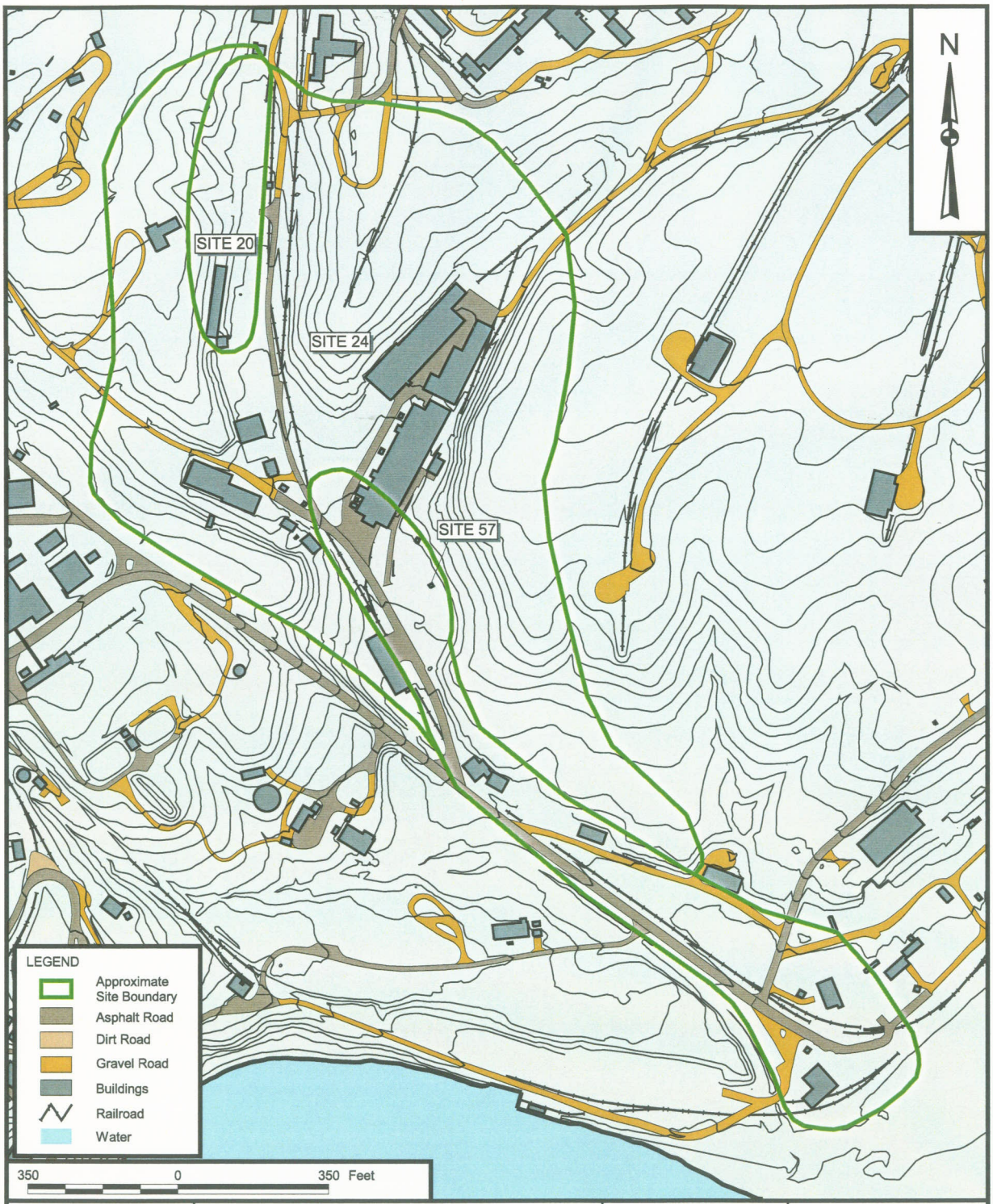

DRAWN BY: K. PEILA — DATE: 8/7/02	Tetra Tech NUS, Inc.	CONTRACT NUMBER: 2193	OWNER NO.: —
CHECKED BY: GJL — DATE: 12/29/06	SITE 20 - SINGLE-BASED POWDER FACILITY, SITE 24 - ABANDONED DRAIN LINES AND SITE 57 - BUILDING 292 TCE CONTAMINATION MAIN AREA NAVAL SUPPORT FACILITY, INDIAN HEAD INDIAN HEAD, MARYLAND	APPROVED BY: GJL — DATE: 12/29/06	
COST/SCHEDULE-AREA		APPROVED BY: — — DATE: —	
SCALE: AS NOTED		DRAWING NO.: FIGURE A-17	REV: 0

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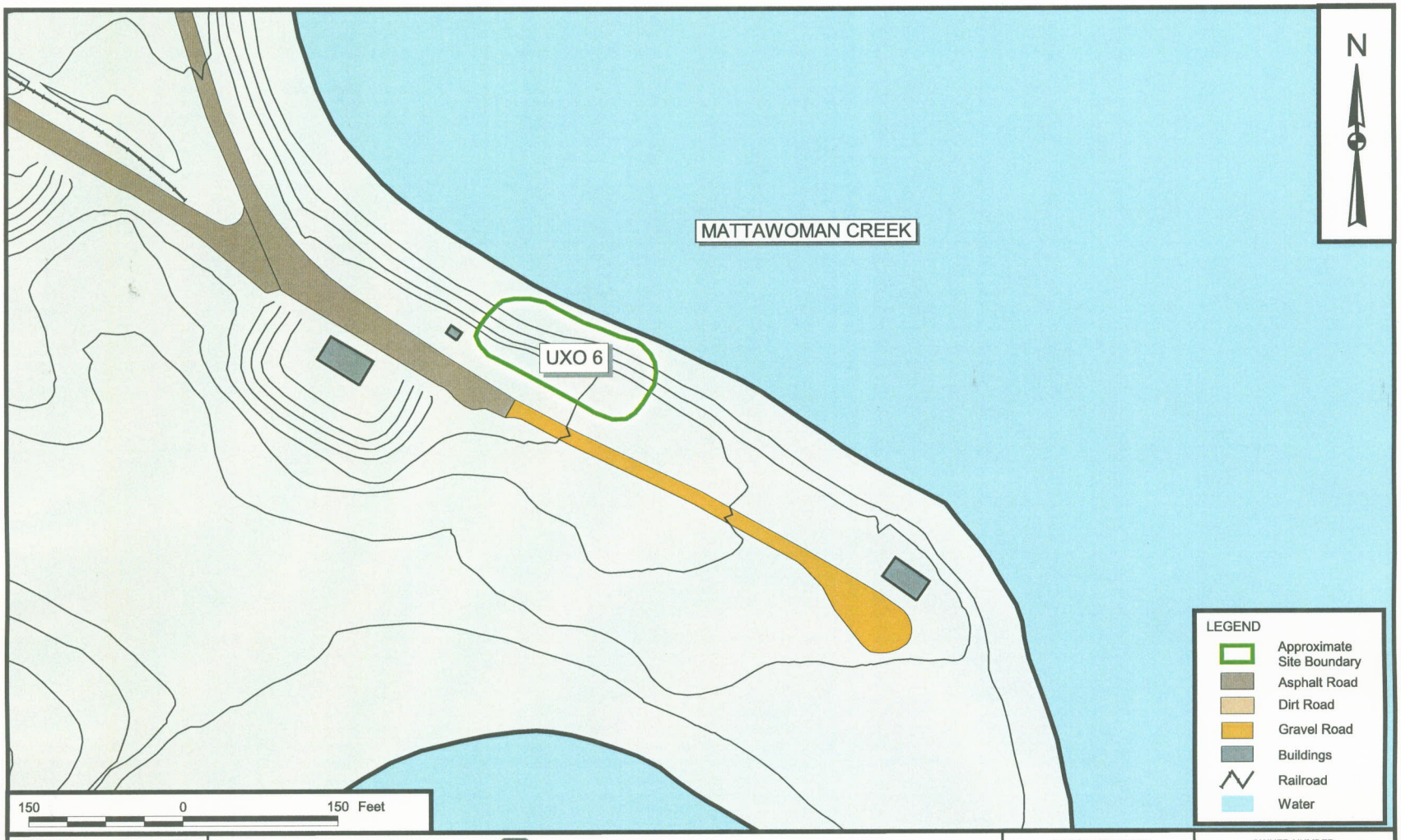

DRAWN BY: K. PEILA — DATE: 8/7/02	Tetra Tech NUS, Inc.	CONTRACT NUMBER: 2193	OWNER NUMBER: —
CHECKED BY: GJL — DATE: 12/29/06	UXO 6 - NG SLUMS BURNING SITE MAIN AREA NAVAL SUPPORT FACILITY, INDIAN HEAD INDIAN HEAD, MARYLAND	APPROVED BY: GJL — DATE: 12/29/06	
COST/SCHEDULE-AREA		APPROVED BY: — — DATE: —	
SCALE: AS NOTED		DRAWING NO.: FIGURE A-18	REV: 0

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DRAWN BY: K. PEILA — DATE: 8/7/02	Tetra Tech NUS, Inc.	CONTRACT NUMBER: 2193	OWNER NUMBER: —
CHECKED BY: GJL — DATE: 12/29/06	SITE 23 - HYDRAULIC OIL DISCHARGES FROM EXTRUSION PLANT MAIN AREA NAVAL SUPPORT FACILITY, INDIAN HEAD INDIAN HEAD, MARYLAND	APPROVED BY: GJL — DATE: 12/29/06	
COST/SCHEDULE-AREA		APPROVED BY: — — DATE: —	
SCALE: AS NOTED		DRAWING NO.: FIGURE A-19	REV: 0

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DRAWN BY: K. PEILA — DATE: 8/7/02	Tetra Tech NUS, Inc.	CONTRACT NUMBER: 2193	OWNER NUMBER: —
CHECKED BY: GJL — DATE: 12/29/06	SITE 25 - HYPO DISCHARGE X-RAY BUILDING NO. 2 MAIN AREA NAVAL SUPPORT FACILITY, INDIAN HEAD INDIAN HEAD, MARYLAND	APPROVED BY: GJL — DATE: 12/29/06	
COST/SCHEDULE-AREA		APPROVED BY: — — DATE: —	
SCALE: AS NOTED		DRAWING NO.: FIGURE A-20	REV: 0

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DRAWN BY: K. PEILA — DATE: 8/7/02	Tetra Tech NUS, Inc.	CONTRACT NUMBER: 2193	OWNER NUMBER: —
CHECKED BY: GJL — DATE: 12/29/06	SITE 26 - THERMAL DESTRUCTOR 2 MAIN AREA NAVAL SUPPORT FACILITY , INDIAN HEAD INDIAN HEAD, MARYLAND	APPROVED BY: GJL — DATE: 12/29/06	
COST/SCHEDULE-AREA		APPROVED BY: — — DATE: —	
SCALE: AS NOTED		DRAWING NO.: FIGURE A-21	REV: 0

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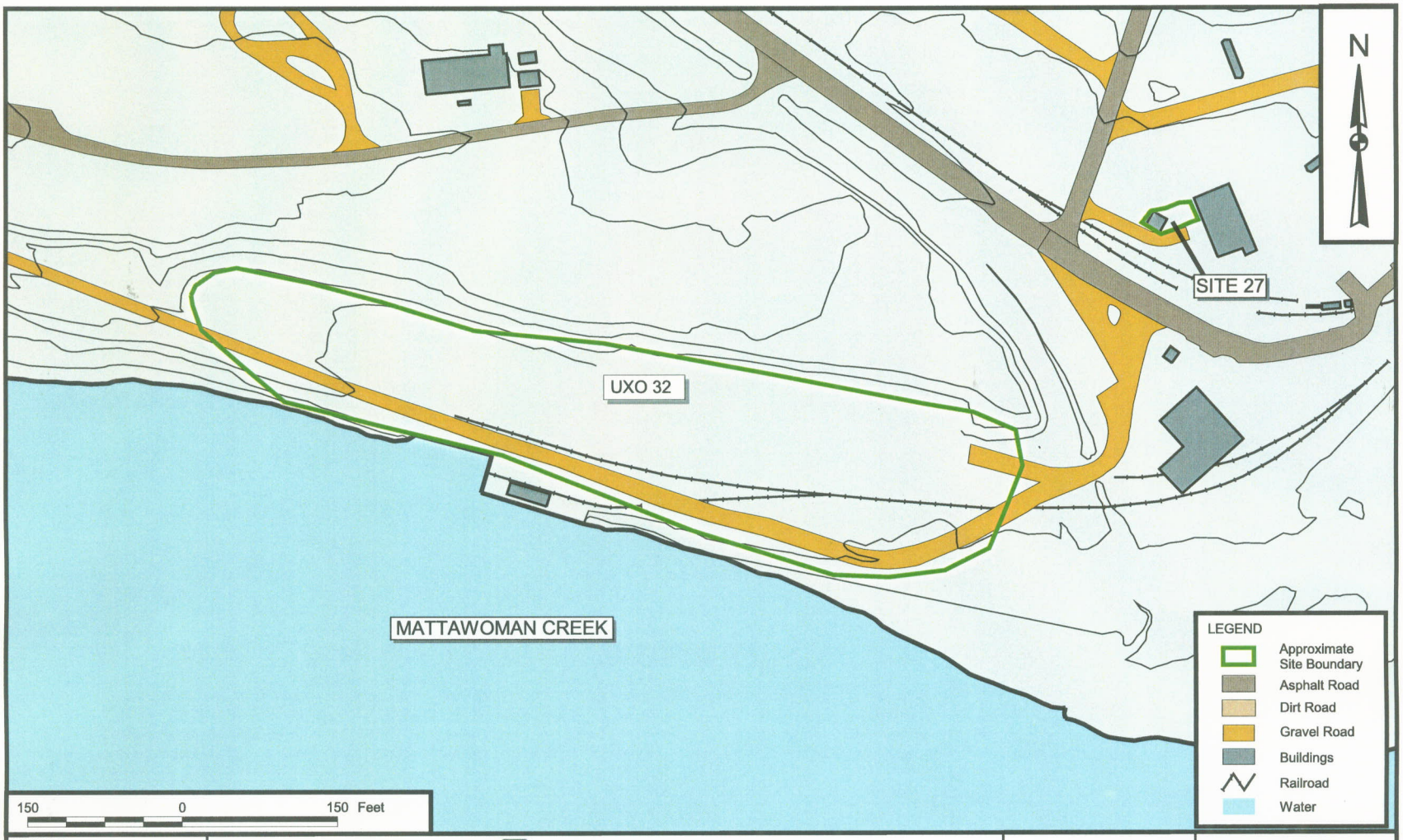

DRAWN BY: K. PEILA — DATE: 8/7/02	Tetra Tech NUS, Inc.	CONTRACT NUMBER: 2193	OWNER NUMBER: —
CHECKED BY: GJL — DATE: 12/29/06	SITE 27 - THERMAL DESTRUCTOR 1 AND UXO 32 - SCRAP YARD MAIN AREA NAVAL SUPPORT FACILITY, INDIAN HEAD INDIAN HEAD, MARYLAND	APPROVED BY: GJL — DATE: 12/29/06	
COST/SCHEDULE-AREA		APPROVED BY: — — DATE: —	
SCALE: AS NOTED		DRAWING NO.: FIGURE A-22	REV: 0

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DRAWN BY: K. PEILA — DATE: 8/7/02	Tetra Tech NUS, Inc.	CONTRACT NUMBER: 2193	OWNER NUMBER: —
CHECKED BY: GJL — DATE: 12/29/06	UXO 8 - ORIGINAL BURNING GROUND MAIN AREA NAVAL SUPPORT FACILITY, INDIAN HEAD INDIAN HEAD, MARYLAND	APPROVED BY: GJL — DATE: 12/29/06	
COST/SCHEDULE-AREA		APPROVED BY: — — DATE: —	
SCALE: AS NOTED		DRAWING NO.: FIGURE A-23	REV: 0

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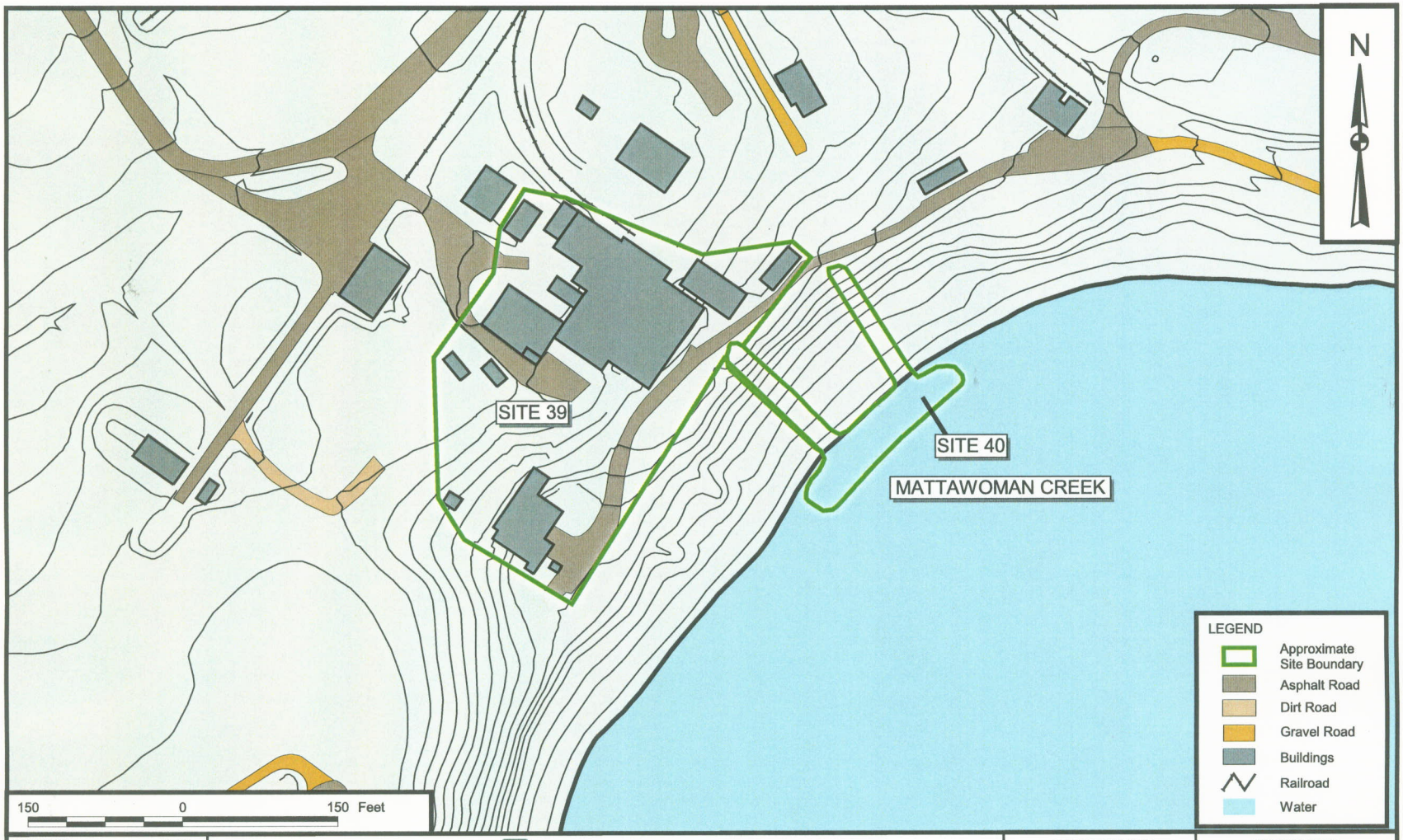

DRAWN BY: K. PEILA — DATE: 8/7/02	Tetra Tech NUS, Inc.	CONTRACT NUMBER: 2193	OWNER NUMBER: —
CHECKED BY: GJL — DATE: 12/29/06	SITE 39 - SILVER RELEASE TO SEDIMENT AND SITE 40 - PALLADIUM CATALYST IN SEDIMENT MAIN AREA NAVAL SUPPORT FACILITY, INDIAN HEAD INDIAN HEAD, MARYLAND	APPROVED BY: GJL — DATE: 12/29/06	
COST/SCHEDULE-AREA		APPROVED BY: — — DATE: —	
SCALE: AS NOTED		DRAWING NO.: FIGURE A-24	REV: 0

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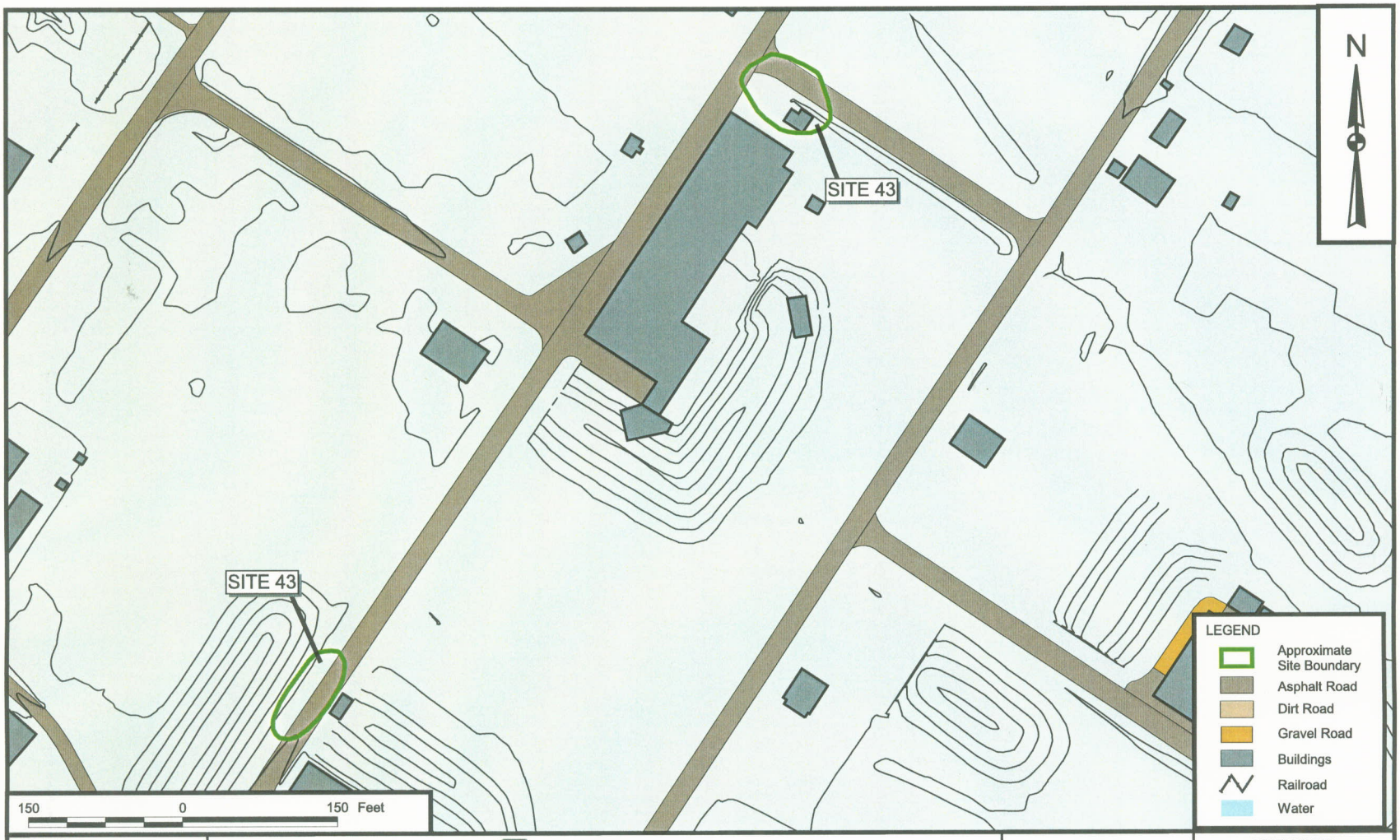

DRAWN BY: K. PEILA — DATE: 8/7/02	Tetra Tech NUS, Inc.	CONTRACT NUMBER: 2193	OWNER NUMBER: —
CHECKED BY: GJL — DATE: 12/29/06	SITE 43 - TOLUENE DISPOSAL SITE MAIN AREA NAVAL SUPPORT FACILITY, INDIAN HEAD INDIAN HEAD, MARYLAND	APPROVED BY: GJL — DATE: 12/29/06	
COST/SCHEDULE-AREA		APPROVED BY: — — DATE: —	
SCALE: AS NOTED		DRAWING NO.: FIGURE A-25	REV: 0

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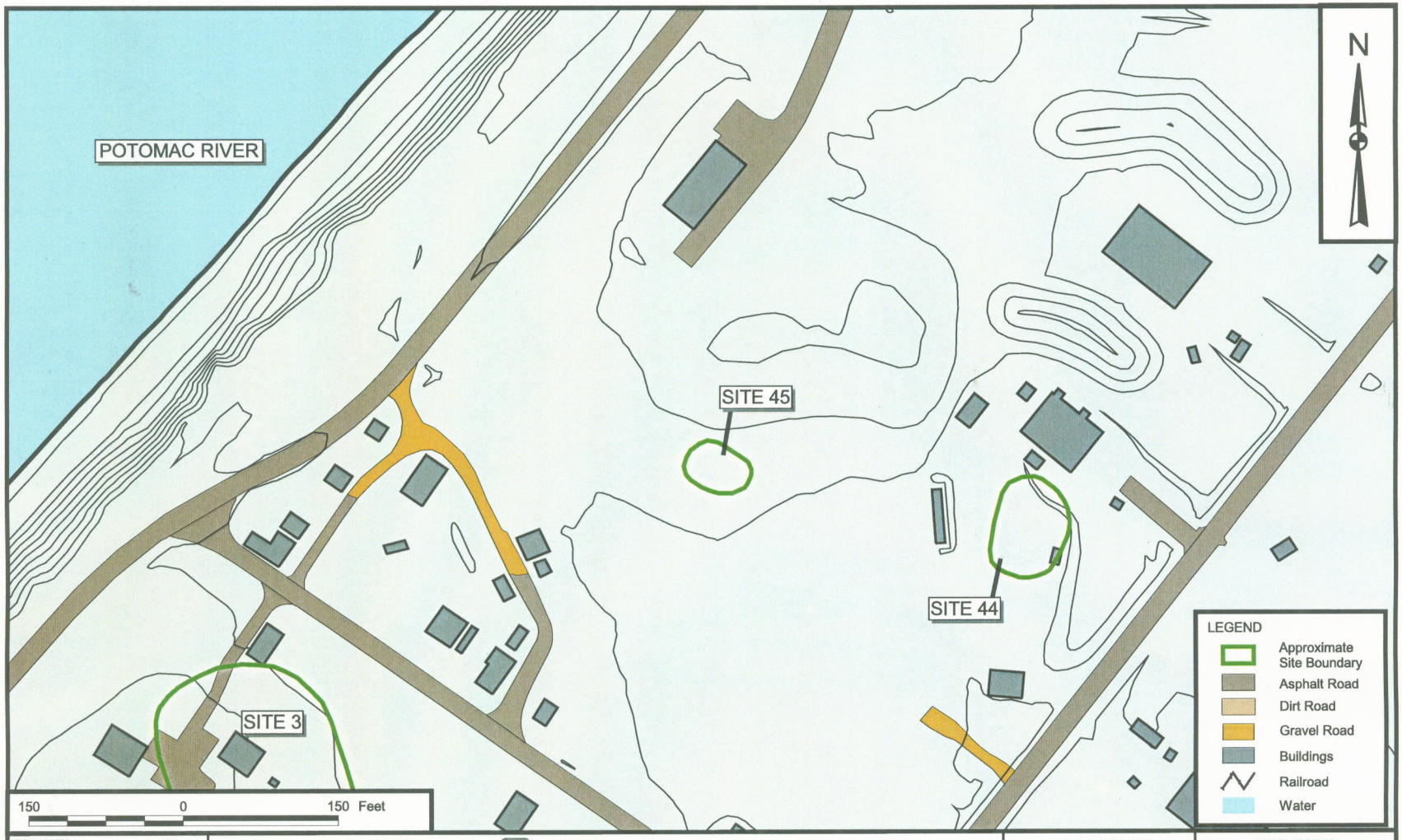

DRAWN BY: K. PEILA — DATE: 8/7/02	Tetra Tech NUS, Inc.	CONTRACT NUMBER: 2193	OWNER NUMBER: —
CHECKED BY: GJL — DATE: 12/29/06	SITE 44 - SOAK OUT AREA AND SITE 45 - ABANDONED DRUMS MAIN AREA NAVAL SUPPORT FACILITY, INDIAN HEAD INDIAN HEAD, MARYLAND	APPROVED BY: GJL — DATE: 12/29/06	
COST/SCHEDULE-AREA		APPROVED BY: — — DATE: —	
SCALE: AS NOTED		DRAWING NO.: FIGURE A-26	REV: 0

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DRAWN BY: K. PEILA	DATE: 8/7/02	Tetra Tech NUS, Inc.	CONTRACT NUMBER: 2193 / OWNER NUMBER: —
CHECKED BY: GJL	DATE: 12/29/06	SITE 46 - CADMIUM SANDBLAST GRIT AREA AND SITE 47 - MERCURIC NITRATE DISPOSAL AREA MAIN AREA NAVAL SUPPORT FACILITY, INDIAN HEAD INDIAN HEAD, MARYLAND	APPROVED BY: GJL / DATE: 12/29/06
COST/SCHEDULE-AREA			APPROVED BY: — / DATE: —
SCALE: AS NOTED			DRAWING NO.: FIGURE A-27 / REV: 0

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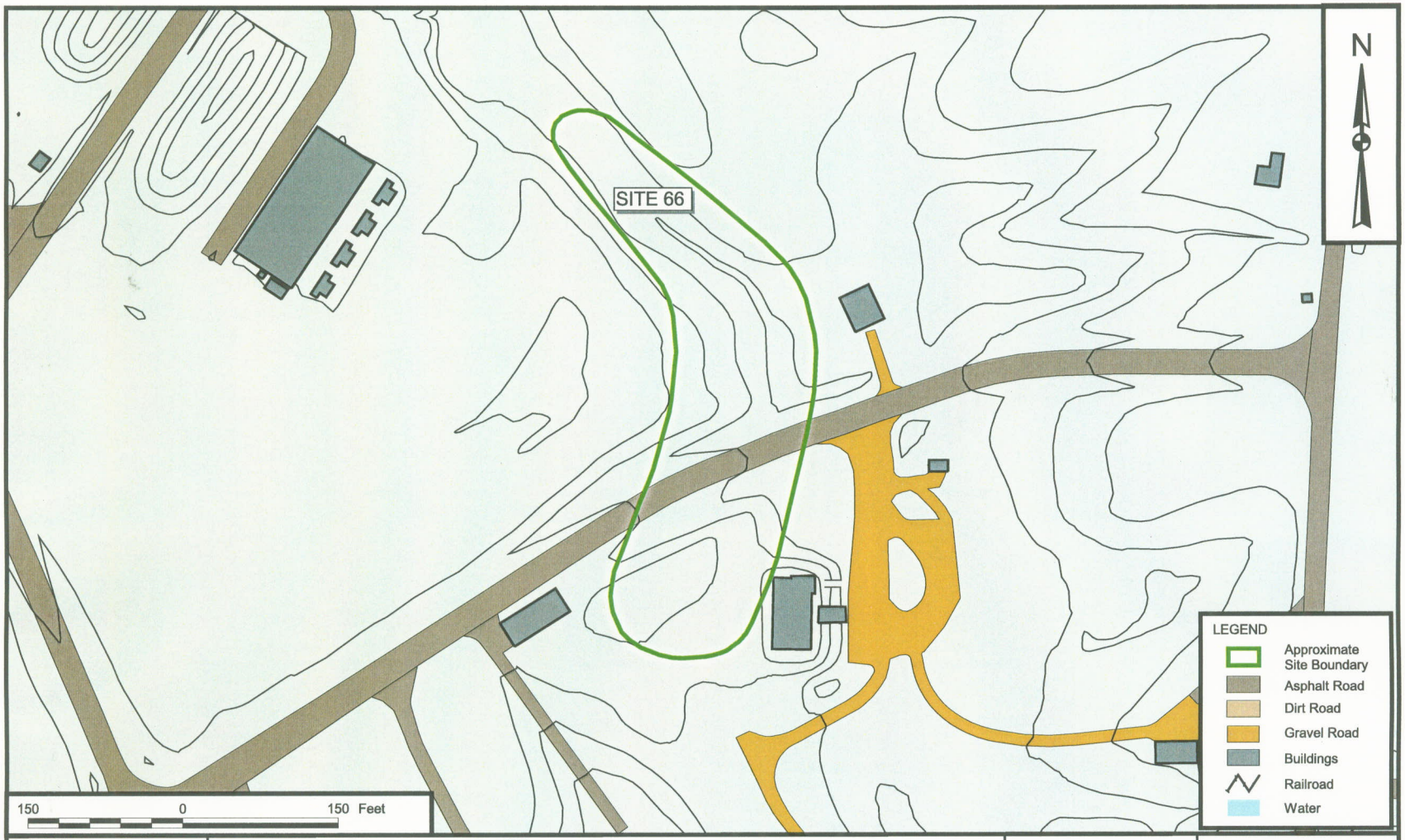

DRAWN BY: K. PEILA — DATE: 6/22/05	Tetra Tech NUS, Inc.	CONTRACT NUMBER: 2193	OWNER NUMBER: —
CHECKED BY: GJL — DATE: 12/29/06	SITE 66 - TURKEY RUN DISPOSAL AREA MAIN AREA NAVAL SUPPORT FACILITY, INDIAN HEAD INDIAN HEAD, MARYLAND	APPROVED BY: GJL — DATE: 12/29/06	
COST/SCHEDULE-AREA		APPROVED BY: — — DATE: —	
SCALE: AS NOTED		DRAWING NO.: FIGURE A-28	REV: 0

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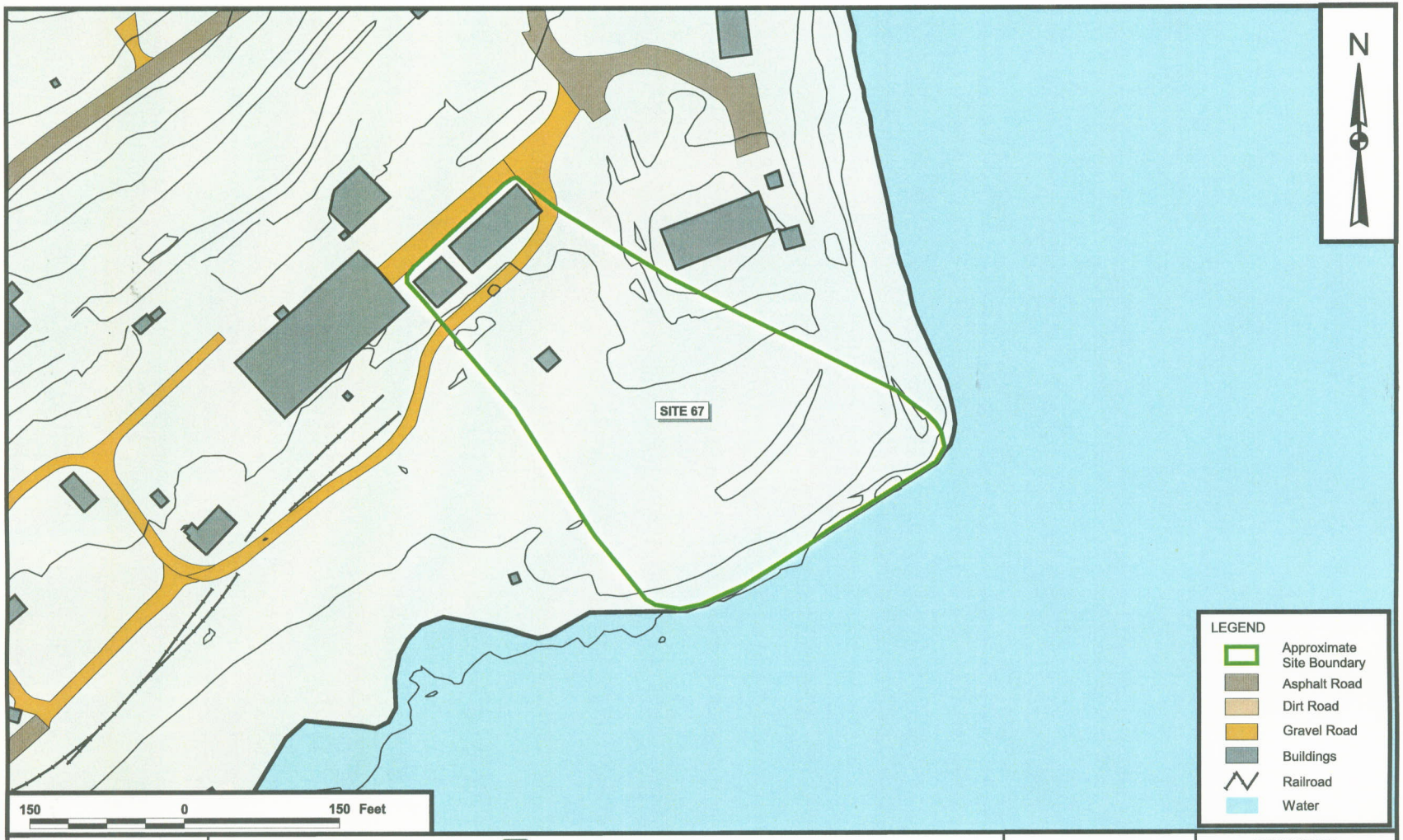

DRAWN BY: K. PEILA — DATE: 6/22/05	Tetra Tech NUS, Inc.	CONTRACT NUMBER: 2193	OWNER NUMBER: —
CHECKED BY: GJL — DATE: 12/29/06	SITE 67 - HOG OUT FACILITY MAIN AREA NAVAL SUPPORT FACILITY, INDIAN HEAD INDIAN HEAD, MARYLAND	APPROVED BY: GJL — DATE: 12/29/06	
COST/SCHEDULE-AREA		APPROVED BY: — — DATE: —	
SCALE: AS NOTED		DRAWING NO.: FIGURE A-29	REV: 0

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DRAWN BY: K. PEILA — DATE: 8/7/02	Tetra Tech NUS, Inc.	CONTRACT NUMBER: 2193	OWNER NUMBER: —
CHECKED BY: GJL — DATE: 12/29/06	UXO 13 - FDR SKEET RANGE MAIN AREA NAVAL SUPPORT FACILITY, INDIAN HEAD INDIAN HEAD, MARYLAND	APPROVED BY: GJL — DATE: 12/29/06	
COST/SCHEDULE-AREA		APPROVED BY: — — DATE: —	
SCALE: AS NOTED		DRAWING NO.: FIGURE A-30	REV: 0

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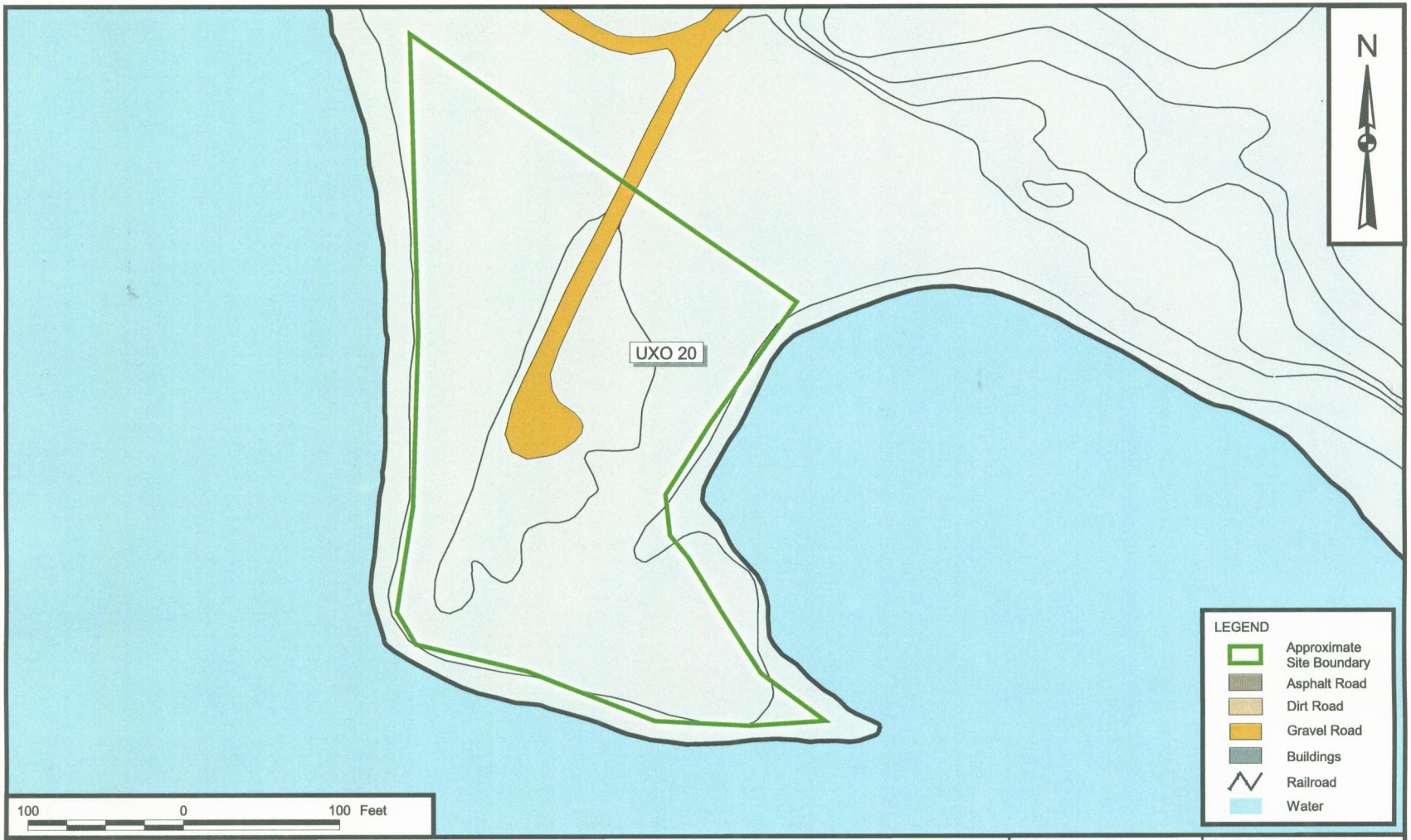

DRAWN BY K. PEILA DATE 8/7/02	Tetra Tech NUS, Inc.	CONTRACT NUMBER 2193	OWNER NUMBER —
CHECKED BY GJL DATE 12/29/06	UXO 20 - SAFETY THERMAL TREATMENT POINT MAIN AREA NAVAL SUPPORT FACILITY, INDIAN HEAD INDIAN HEAD, MARYLAND	APPROVED BY GJL DATE 12/29/06	
COST/SCHEDULE-AREA		APPROVED BY — DATE —	
SCALE AS NOTED		DRAWING NO. FIGURE A-31	REV 0

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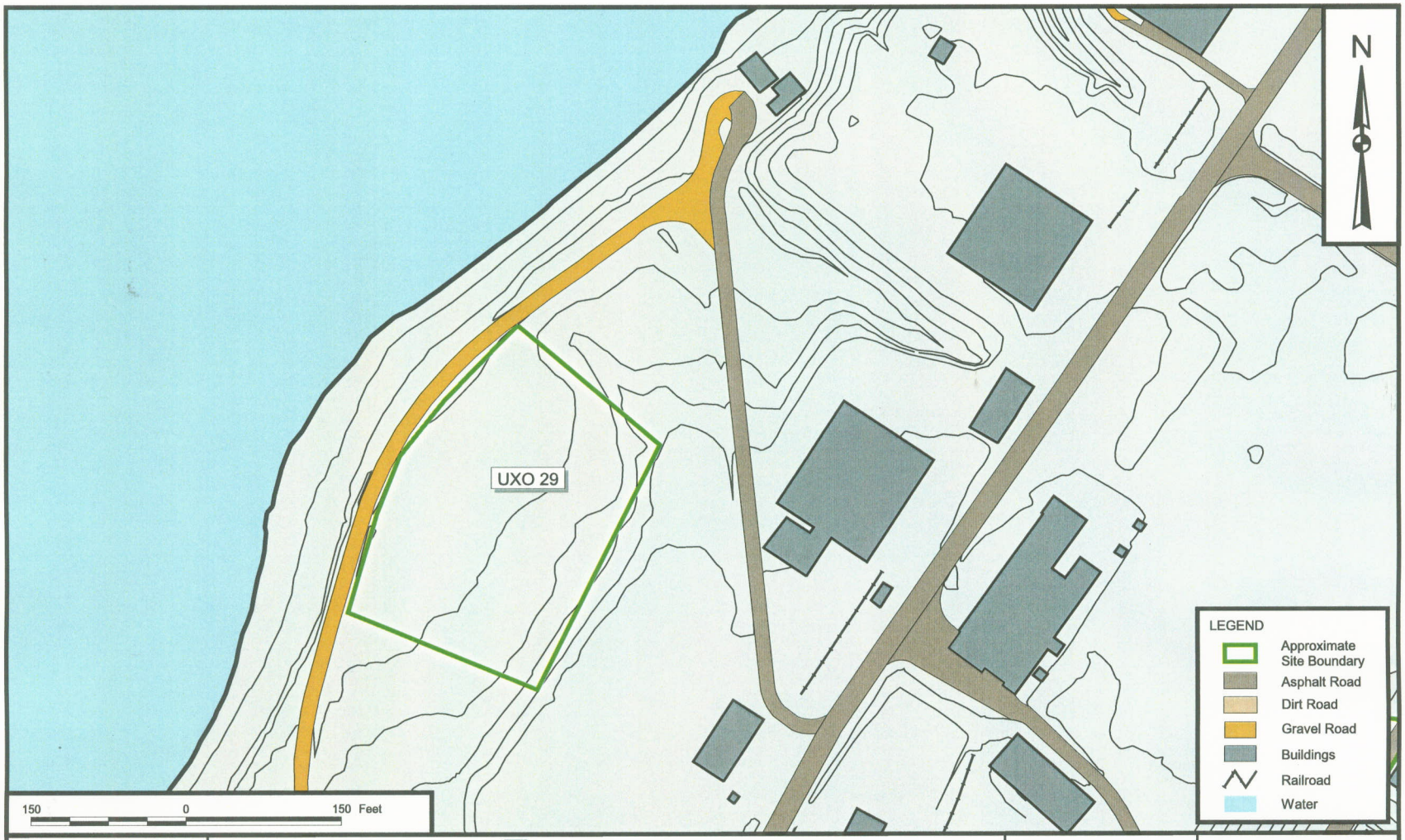

DRAWN BY K. PEILA DATE 8/7/02	Tetra Tech NUS, Inc.	CONTRACT NUMBER 2193	OWNER NUMBER —
CHECKED BY GJL DATE 12/29/06	UXO 29 - SOUTHWESTERN PISTOL RANGE MAIN AREA NAVAL SUPPORT FACILITY, INDIAN HEAD INDIAN HEAD, MARYLAND	APPROVED BY GJL DATE 12/29/06	
COST/SCHEDULE-AREA		APPROVED BY — DATE —	
SCALE AS NOTED		DRAWING NO. FIGURE A-32	REV 0

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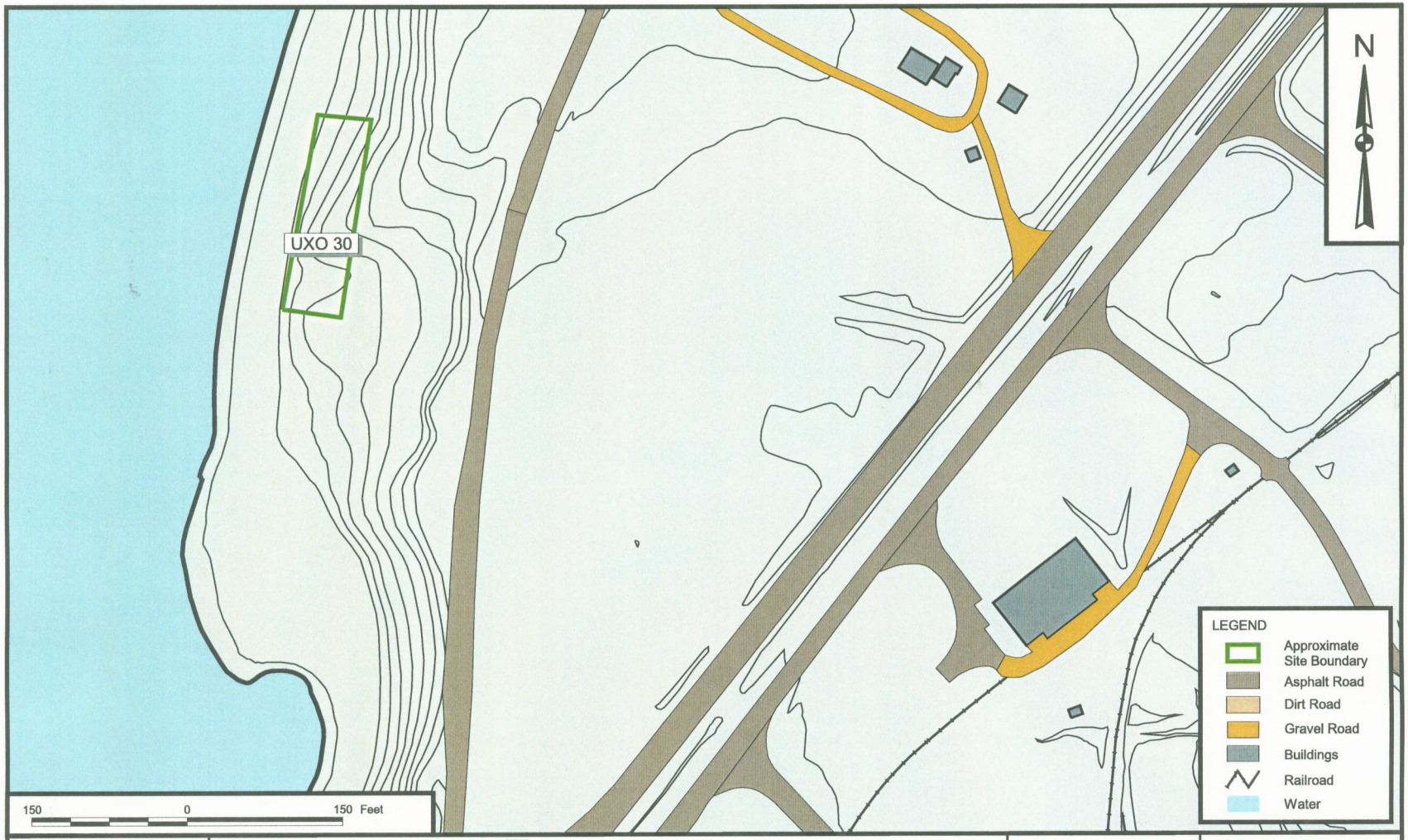

DRAWN BY: K. PEILA — DATE: 8/7/02	Tetra Tech NUS, Inc.	CONTRACT NUMBER: 2193	OWNER NUMBER: —
CHECKED BY: GJL — DATE: 12/29/06	UXO 30 - GATE 3 BURING GROUND MAIN AREA NAVAL SUPPORT FACILITY, INDIAN HEAD INDIAN HEAD, MARYLAND	APPROVED BY: GJL — DATE: 12/29/06	
COST/SCHEDULE-AREA		APPROVED BY: — — DATE: —	
SCALE: AS NOTED		DRAWING NO.: FIGURE A-33	REV: 0

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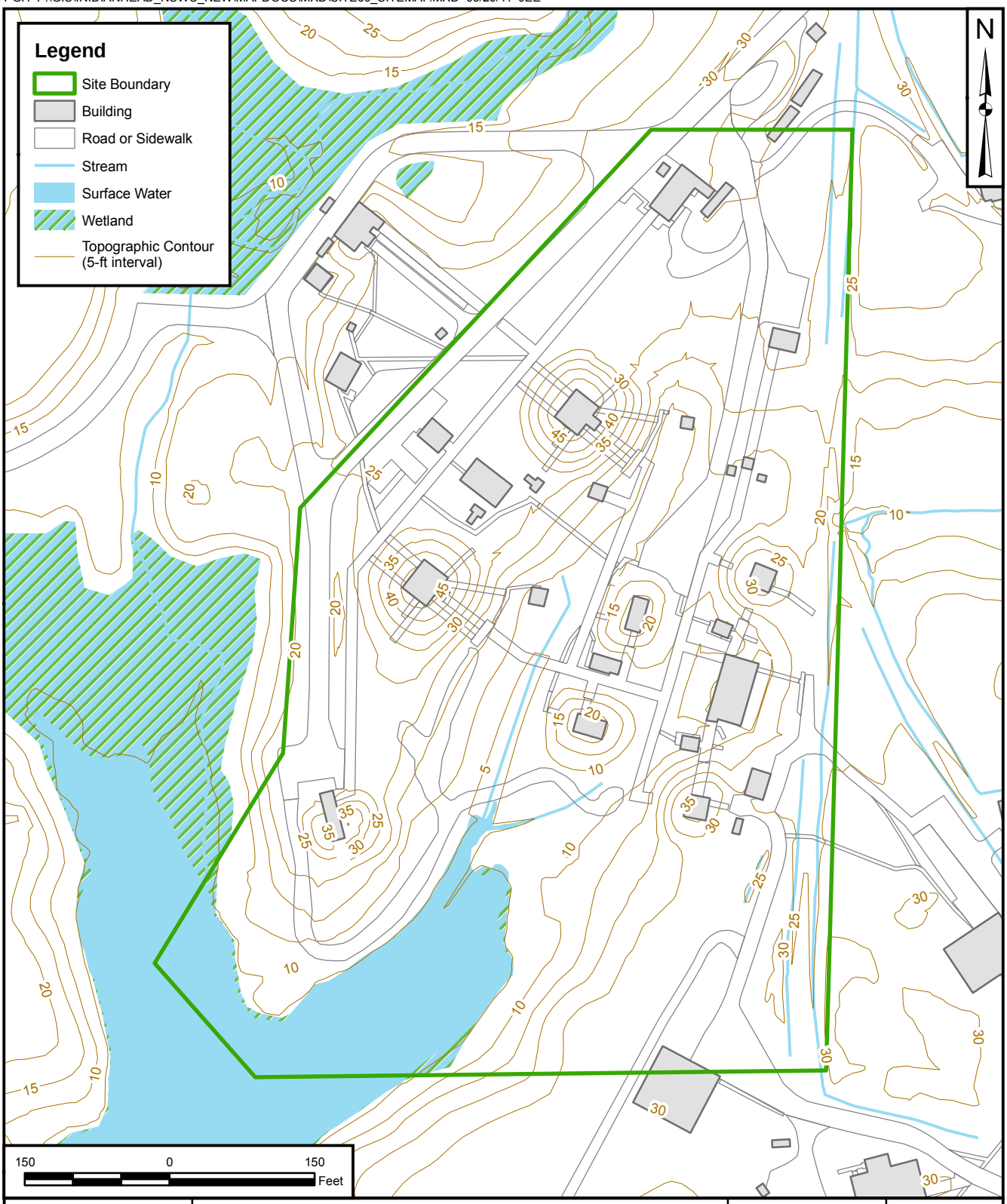

DRAWN BY: J. ENGLISH — DATE: 06/20/11	TETRA TECH	CONTRACT NUMBER: —	CTO NUMBER: —
CHECKED BY: E. CORACK — DATE: 06/20/11	SITE 69 - BUILDING 1018 (OXIDIZER PROCESS BUILDING) MAIN AREA NAVAL SUPPORT FACILITY INDIAN HEAD INDIAN HEAD, MARYLAND	APPROVED BY: — — DATE: —	
REVISED BY: — — DATE: —		APPROVED BY: — — DATE: —	
SCALE: AS NOTED		FIGURE NO.: A-34	REV: 0

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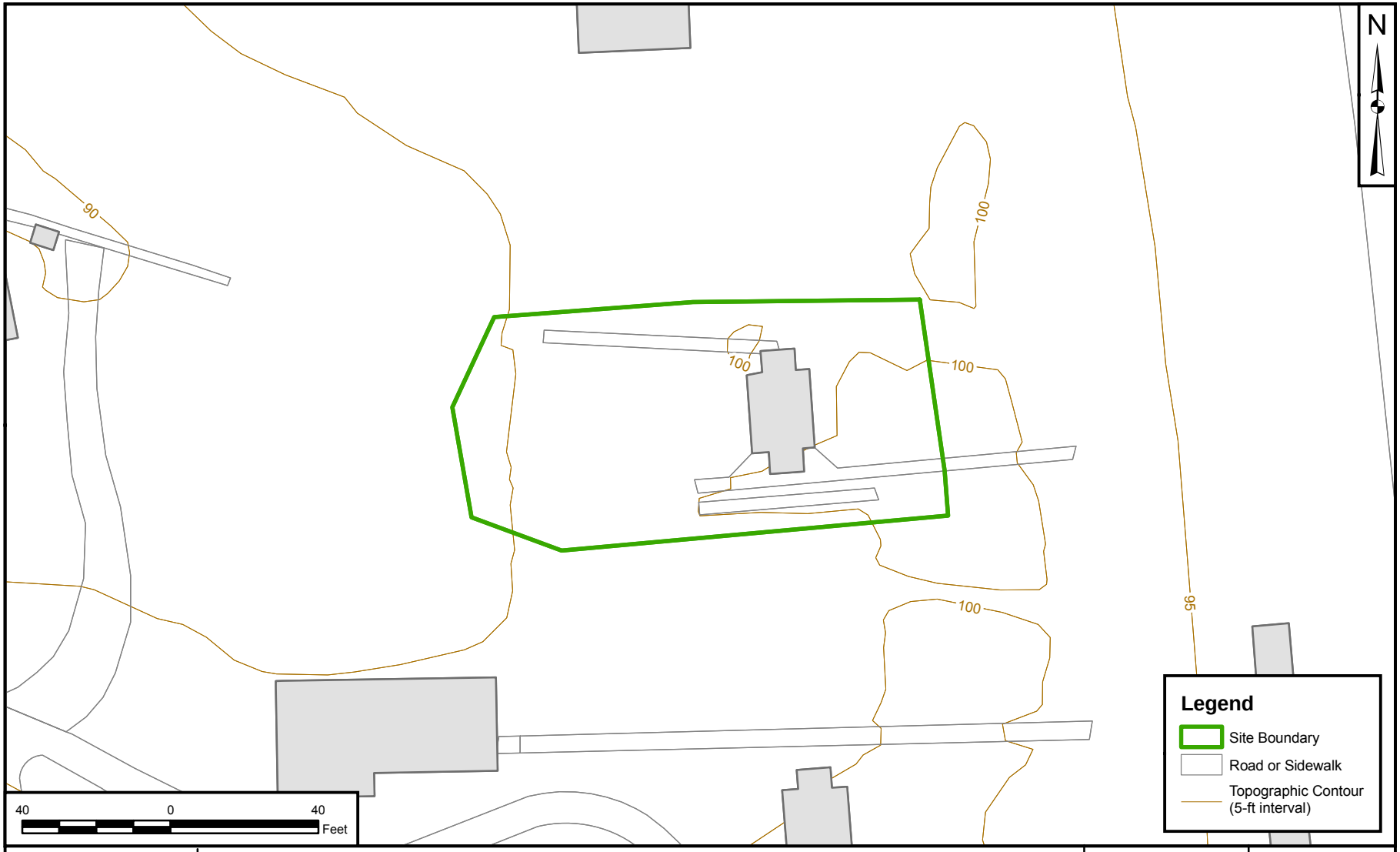
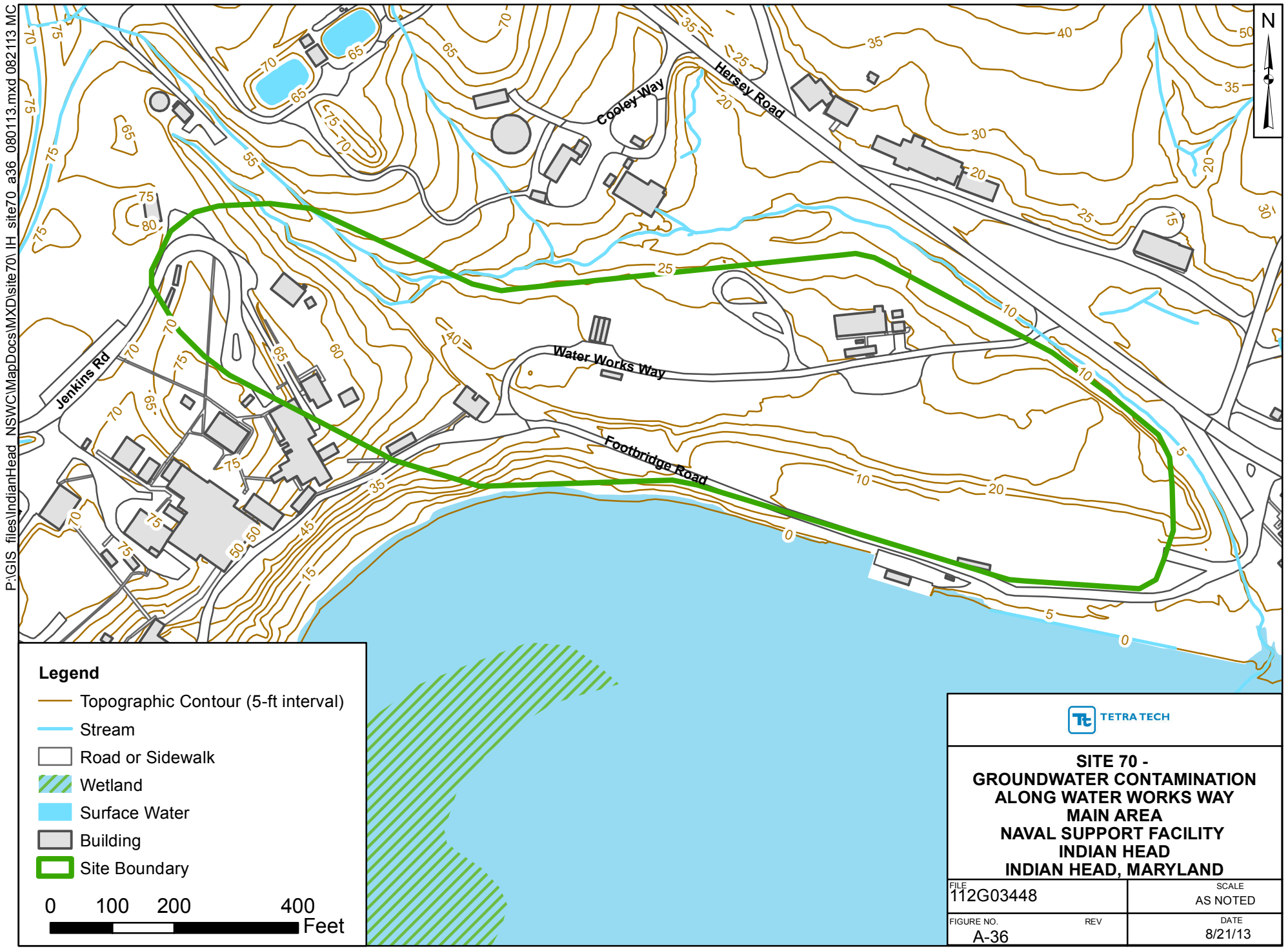


DRAWN BY: J. ENGLISH	DATE: 06/20/11	TETRA TECH	CONTRACT NUMBER: ___ / CTO NUMBER: ___
CHECKED BY: E. CORACK	DATE: 06/20/11	AOC 31 - BUILDING 259 (STOREHOUSE / DETONATOR PRODUCTION) MAIN AREA NAVAL SUPPORT ACTIVITY INDIAN HEAD INDIAN HEAD, MARYLAND	APPROVED BY: ___ / DATE: ___
REVISED BY: ___	DATE: ___		APPROVED BY: ___ / DATE: ___
SCALE: AS NOTED			FIGURE NO.: A-35 / REV: 0


P:\GIS files\IndianHead_NSWC\MapDocs\MXD\site70\IH_site70_a36_080113.mxd 082113 MC
N
Cooley Way
Hersey Road
Water Works Way
Footbridge Road
Jenkins Rd
Legend
Topographic Contour (5-ft interval)
Stream
Road or Sidewalk
Wetland
Surface Water
Building
Site Boundary
0 100 200 400
Feet
TETRA TECH
SITE 70 -
GROUNDWATER CONTAMINATION
ALONG WATER WORKS WAY
MAIN AREA
NAVAL SUPPORT FACILITY
INDIAN HEAD
INDIAN HEAD, MARYLAND
FILE
112G03448
SCALE
AS NOTED
FIGURE NO.
A-36
REV
DATE
8/21/13

APPENDIX B

NSFIH – Stump Neck Annex Site Figures

TABLE B-1
FIGURE INDEX
INSTALLATION RESTORATION (IR) PROGRAM SITES
STUMP NECK ANNEX
NSFIH, INDIAN HEAD, MARYLAND

IR Site ID	SWMU ID	MRP UXO ID	Name of IR Site	Figure No.
NA			IR Sites, Stump Neck Annex	B-1
30	22	10	Stump Neck Impact Area	B-2
31	23	7	Old Demolition Range	B-3
32	11		Suspected Tool Burial Site	B-4
33	7		Scrap Metal Pit	B-5
34	8		Tool Burial Site	B-2
35	9	12	Torpedo Burial Site	B-2
36	10		Closed Landfill	B-6
37	24	3	Causeway	B-7
38	1		Rum Point Landfill	B-8
58	2		Range 3 Burn Point	B-9
59	3		Chicamuxen Creek's Edge Site A	B-9
60	4		Chicamuxen Creek's Edge Site B	B-3
61	5		Range 6	B-10
62	6	1	Air Blast Pond	B-11
63	25	2	Area 8	B-12
64	26	4	IED (+SN SWMU 19)	B-13
65	27	5	IOD	B-14
	14		Photographic Lab Septic System	B-21
	28	15	Old Skeet and Trap Range (+SN SWMU 20)	B-11
	29	17	Small Arms (Pistol) Range	B-8
	30		Building 2015 Dry Well	B-22
		14	Marine Rifle Range	B-11
		16	Rum Point Skeet Range	B-15
		16	Rum Point Skeet Range	B-15
		18	Battle Range Firing (Water Site)	none
		21	Test Area 1	B-16
		22	Test Area 2	B-17
		23	Torpedo Casing Disposal Area	B-18
		25	Roach Road Rifle Range	B-19
		26	The Valley Impact Area	B-20
		27	Sonar Training Area (Water Site)	none
		28	EOD School Demo Area	B-11
		31	Pope's Creek (Water Site)	none

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Aerial photograph taken in 2009.

N

Main Area

Potomac River

Mattawoman Creek

Stump Neck Annex

33 18 27 15 37 3 14 16 4 64 32 14 28 35 12 23 5 62 1 34 36 38 30 17 26 63 65 30 10 2 21 25 26 33 60 31 7 22 58 59 61

Legend

- Site Boundary
- 12 IR Site Number
- 32 MRP UXO Number
- 14 SWMU Site Number
- Approximate Boundary of MRP UXO Site 26

NOTES
MRP Site UXO 33 is a water impact area associated with Main Area shown for reference.
MRP Site UXO 18 is a water impact area associated with Stump Neck Annex.

2,000 0 2,000 Feet

SWMU KEY

14 Photographic Lab Septic System
30 Building 2015 Dry Well

IR SITE KEY

30 Stump Neck Impact Area (Also UXO 10)
31 Old Demolition Range (Also UXO 7)
32 Suspected Tool Burial Site
33 Scrap Metal Pit
34 Tool Burial Site
35 Torpedo Burial Site (Also UXO 12)
36 Closed Landfill
37 Causeway (Also UXO 3)
38 Rum Point Landfill
58 Range 3 Burn Point
59 Chicamuxen Creek's Edge Site A
60 Chicamuxen Creek's Edge Site B
61 Range 6
62 Air Blast Pond (Also UXO 1)
63 Area 8 (Also UXO 2)
64 IED (Also UXO 4)
65 IOD (Also UXO 5)

MRP UXO KEY

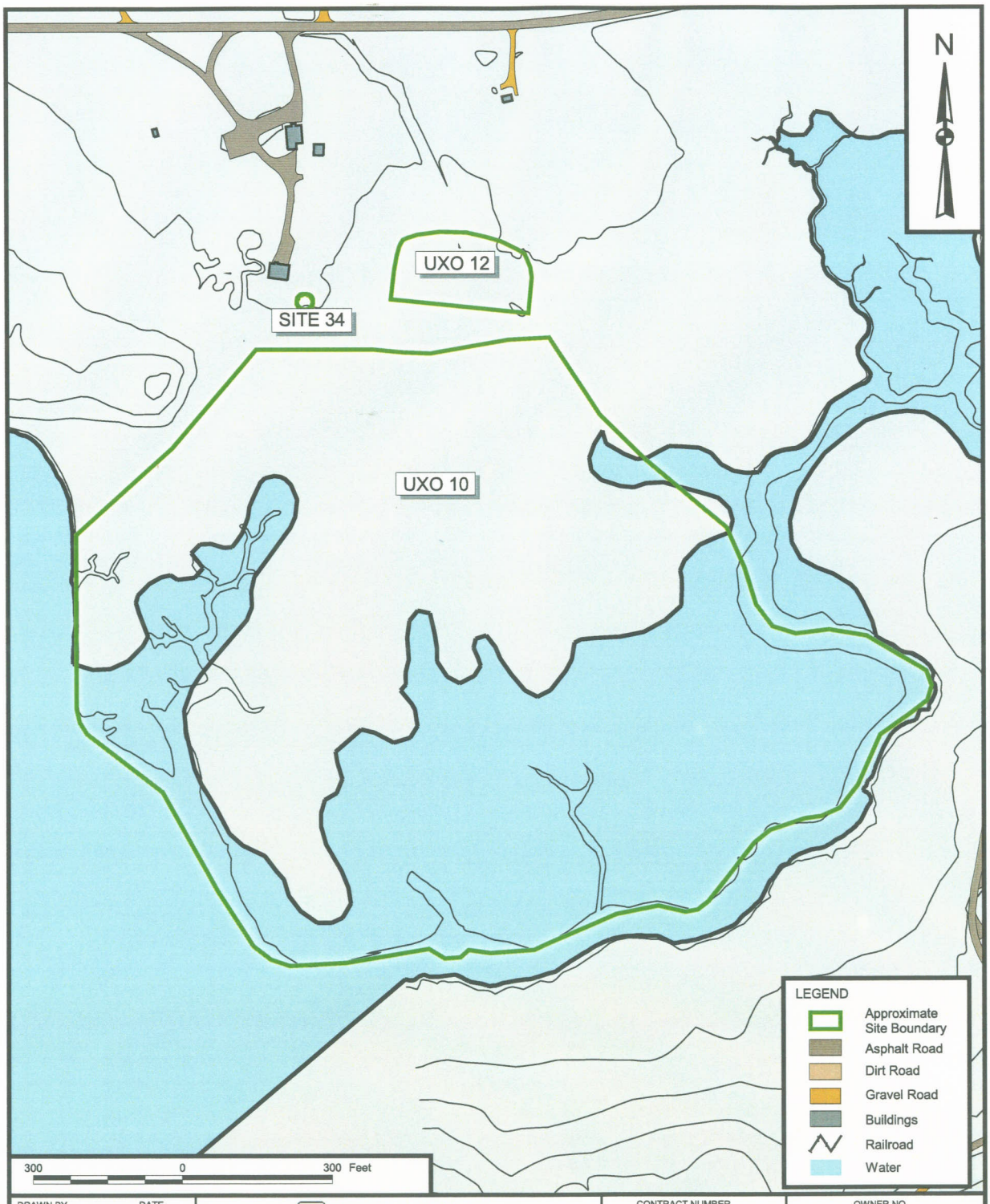
1 Air Blast Pond (Also Site 62)
2 Area 8 (Also Site 63)
3 Causeway (Also Site 37)
4 IED (Also Site 64)
5 IOD (Also Site 65)
7 Old Demolition Range (Also Site 31)
10 Stump Neck Impact Area (Also Site 30)
12 Torpedo Burial Site (Also Site 35)
14 Marine Rifle Range
15 Old Skeet and Trap Range
16 Rum Point Skeet Range
17 Small Arms (Pistol) Range
18 Battle Range Firing Area
21 Test Area 1
22 Test Area 2
23 Torpedo Casing Disposal Area
25 Roach Road Rifle Range
26 The Valley Impact Area
27 Sonar Training Area
28 EOD School Demo Area

DRAWN BY / DATE	J. ENGLISH / 06/29/11
CHECKED BY / DATE	E. CORACK / 06/30/11
REVISED BY / DATE	___ / ___
SCALE	AS NOTED

NAVFAC

SITE LOCATION MAP
STUMP NECK ANNEX
NAVAL SUPPORT FACILITY INDIAN HEAD
INDIAN HEAD, MARTLAND

CONTRACT NUMBER	3448
CTO NUMBER	___
APPROVED BY / DATE	___ / ___
APPROVED BY / DATE	___ / ___
FIGURE NO.	FIGURE B-1
REV	0



DRAWN BY: K. PEILA — DATE: 8/7/02	Tetra Tech NUS, Inc.	CONTRACT NUMBER: 2193	OWNER NO.: —
CHECKED BY: GJL — DATE: 12/29/06	UXO 10 - STUMP NECK IMPACT AREA, SITE 34 - TOOL BURIAL SITE, AND UXO 12 - TORPEDO BURIAL SITE STUMP NECK ANNEX NAVAL SUPPORT FACILITY, INDIAN HEAD INDIAN HEAD, MARYLAND	APPROVED BY: GJL — DATE: 12/29/06	
COST/SCHEDULE-AREA		APPROVED BY: — — DATE: —	
SCALE: AS NOTED		DRAWING NO.: FIGURE B-2	REV: 0

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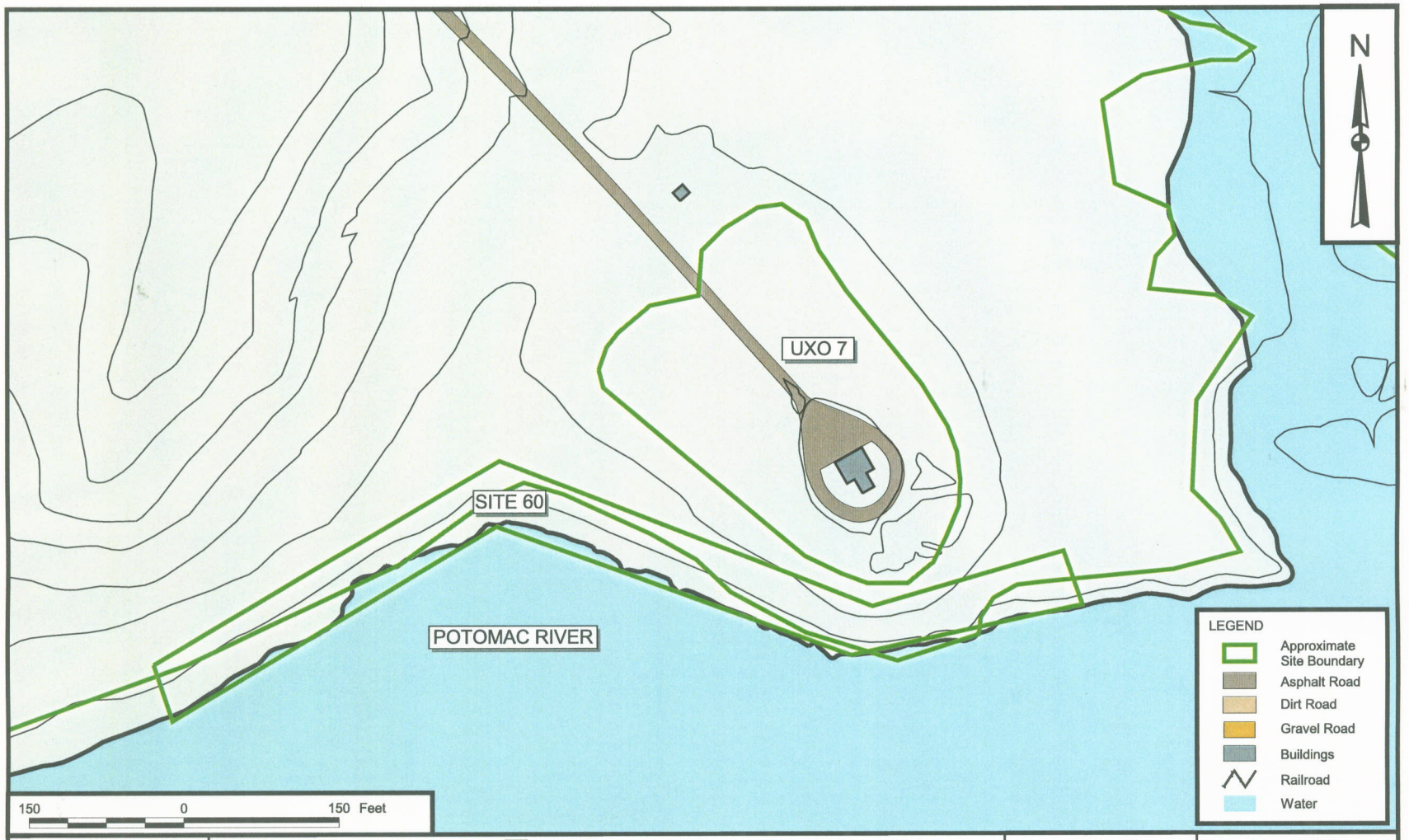

DRAWN BY: K. PEILA — DATE: 8/7/02	Tetra Tech NUS, Inc.	CONTRACT NUMBER: 2193	OWNER NUMBER: —
CHECKED BY: GJL — DATE: 12/29/06	UXO 7 - OLD DEMOLITION RANGE AND SITE 60 - CHICAMUXEN CREEK'S EDGE SITE B STUMP NECK ANNEX NAVAL SUPPORT FACILITY, INDIAN HEAD INDIAN HEAD, MARYLAND	APPROVED BY: GJL — DATE: 12/29/06	
COST/SCHEDULE-AREA		APPROVED BY: — — DATE: —	
SCALE: AS NOTED		DRAWING NO.: FIGURE B-3	REV: 0

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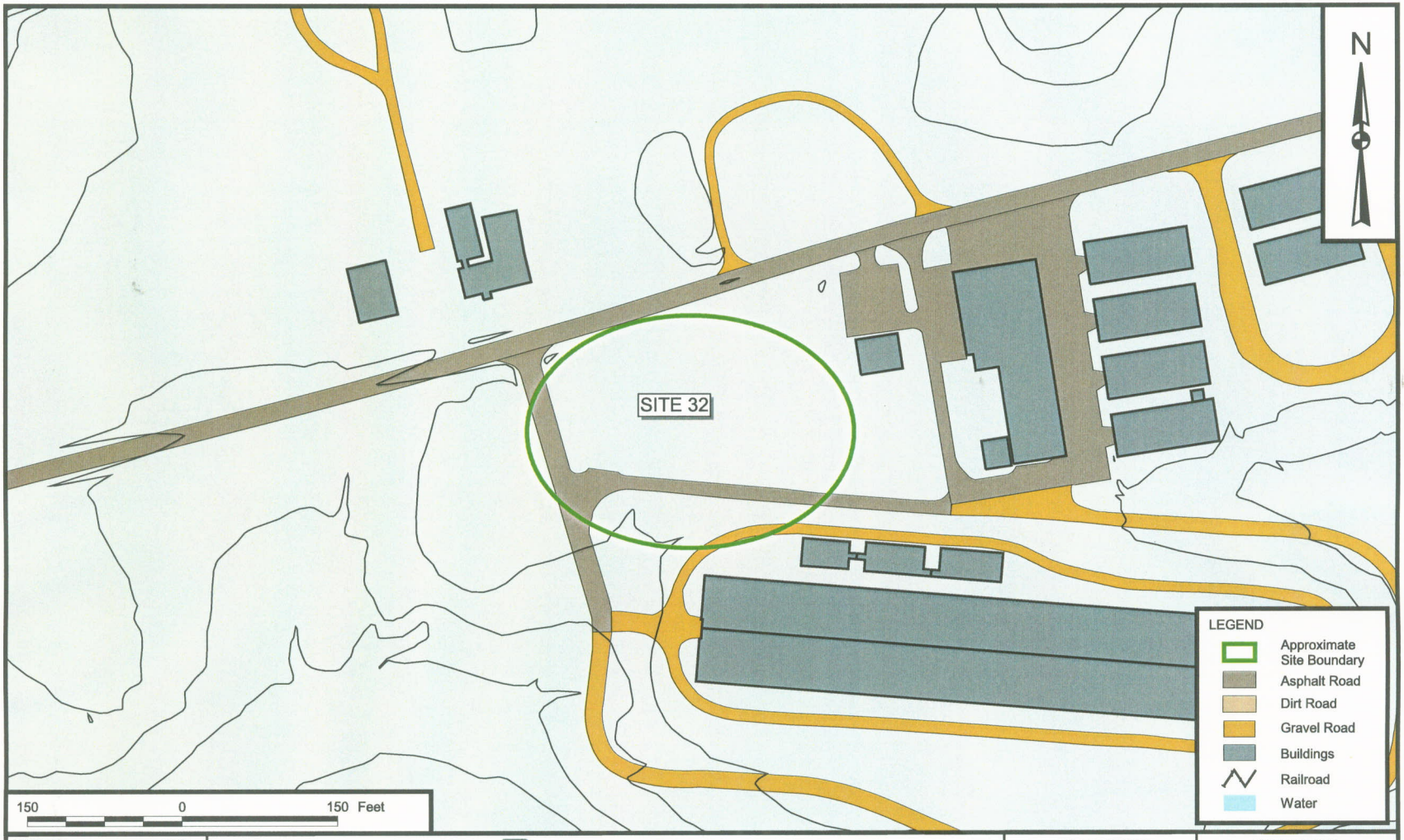

DRAWN BY: K. PEILA — DATE: 8/7/02	Tetra Tech NUS, Inc.	CONTRACT NUMBER: 2193	OWNER NUMBER: —
CHECKED BY: GJL — DATE: 12/29/06	SITE 32 - SUSPECTED TOOL BURIAL SITE STUMP NECK ANNEX NAVAL SUPPORT FACILITY, INDIAN HEAD INDIAN HEAD, MARYLAND	APPROVED BY: GJL — DATE: 12/29/06	
COST/SCHEDULE-AREA		APPROVED BY: — — DATE: —	
SCALE: AS NOTED		DRAWING NO.: FIGURE B-4	REV: 0

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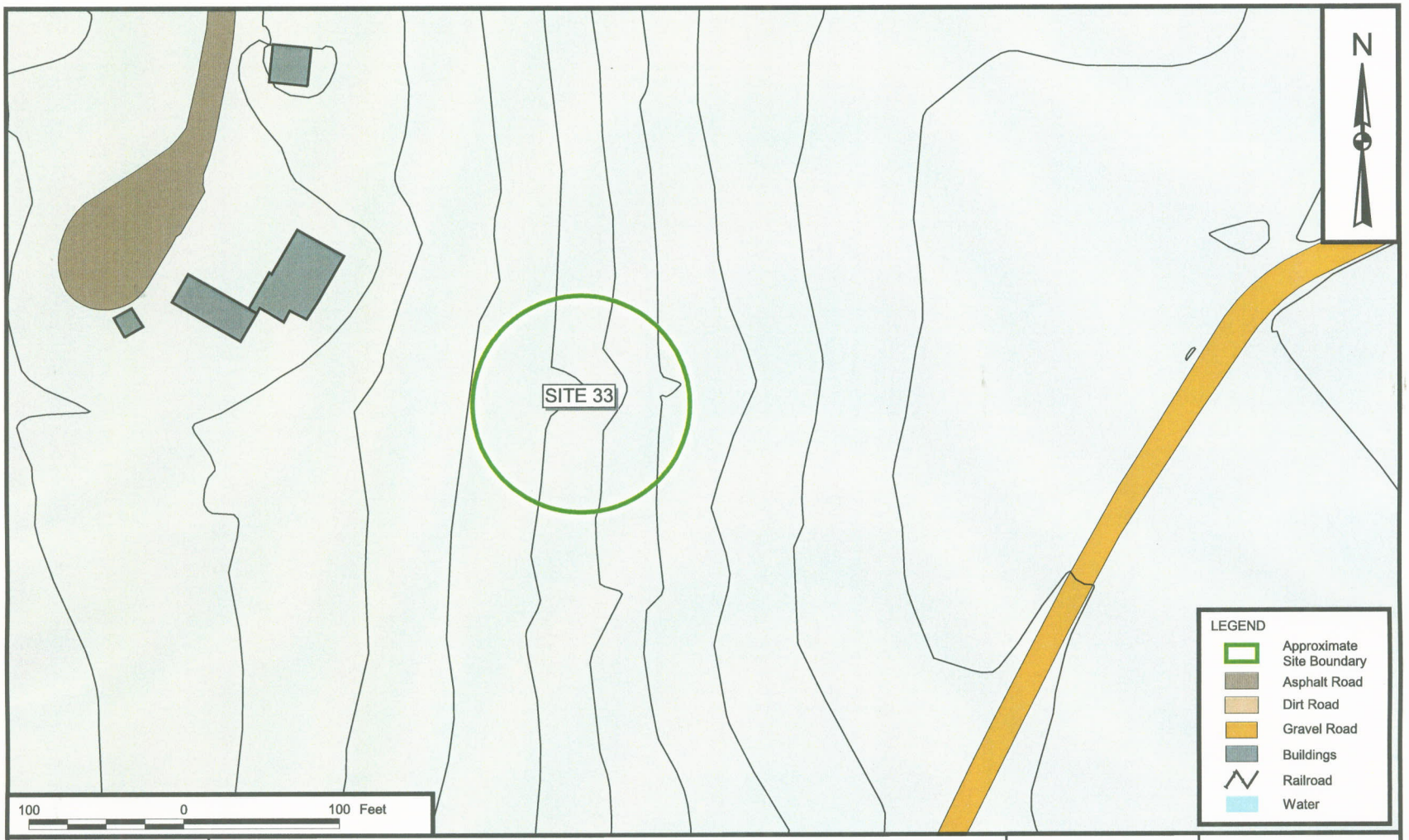

DRAWN BY: K. PEILA — DATE: 8/7/02	Tetra Tech NUS, Inc.	CONTRACT NUMBER: 2193	OWNER NUMBER: —
CHECKED BY: GJL — DATE: 12/29/06	SITE 33 - SCRAP METAL PIT STUMP NECK ANNEX NAVAL SUPPORT FACILITY, INDIAN HEAD INDIAN HEAD, MARYLAND	APPROVED BY: GJL — DATE: 12/29/06	
COST/SCHEDULE-AREA		APPROVED BY: — — DATE: —	
SCALE: AS NOTED		DRAWING NO.: FIGURE B-5	REV: 0

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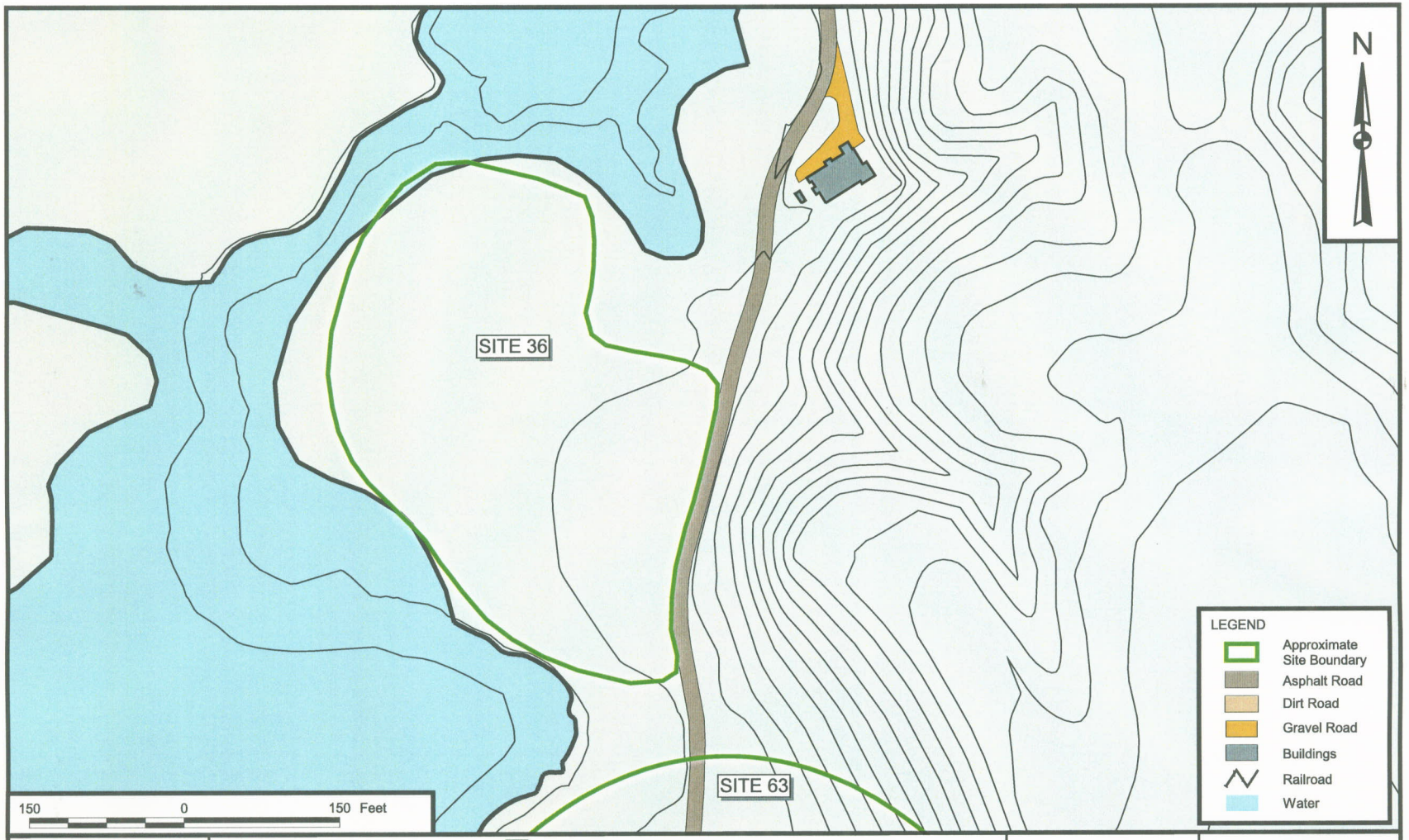

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CHECKED BY: GJL — DATE: 12/29/06	SITE 36 - CLOSED LANDFILL STUMP NECK ANNEX NAVAL SUPPORT FACILITY, INDIAN HEAD INDIAN HEAD, MARYLAND	APPROVED BY: GJL — DATE: 12/29/06	
COST/SCHEDULE-AREA		APPROVED BY: — — DATE: —	
SCALE: AS NOTED		DRAWING NO.: FIGURE B-6	REV: 0

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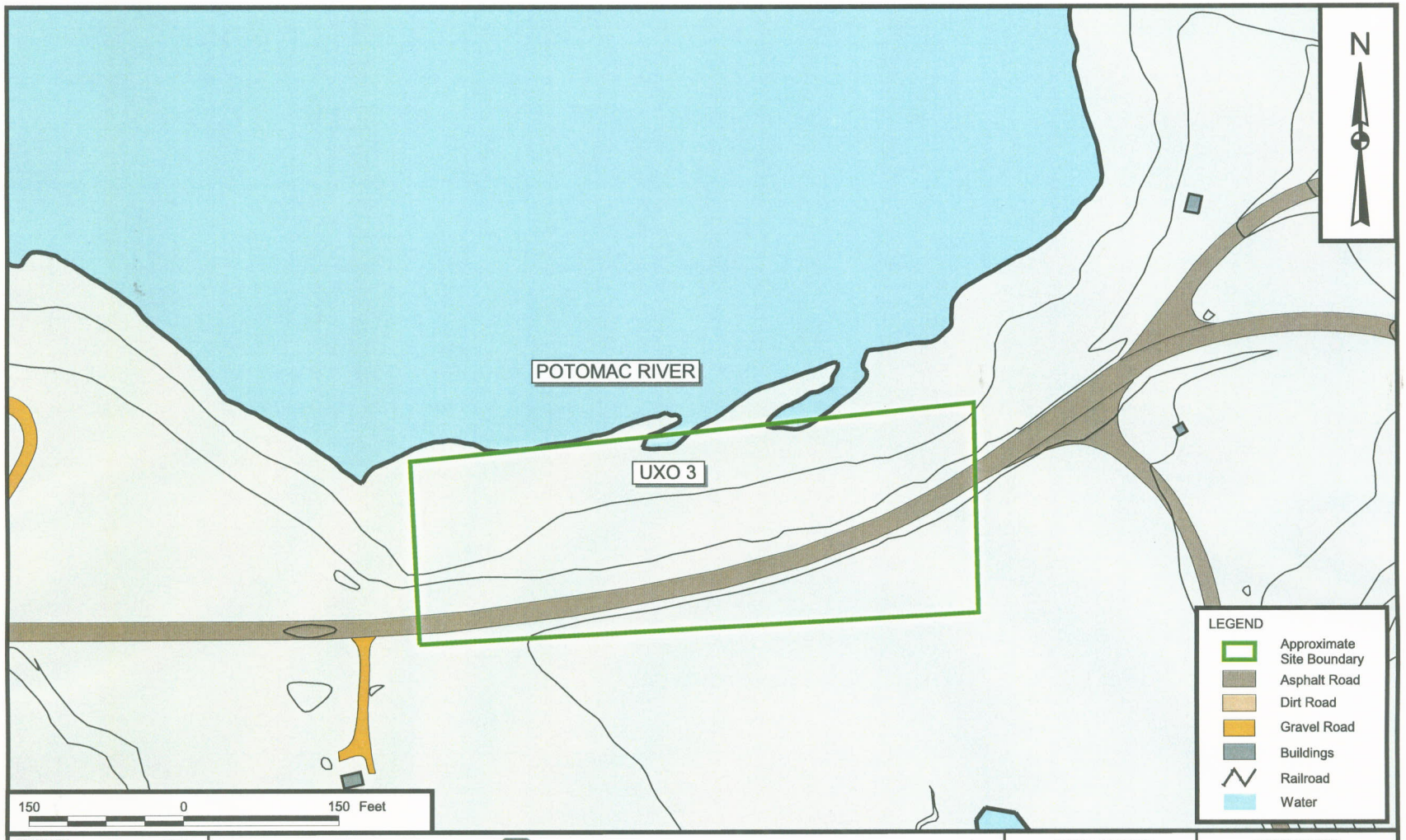

DRAWN BY: K. PEILA — DATE: 8/7/02	Tetra Tech NUS, Inc.	CONTRACT NUMBER: 2193	OWNER NUMBER: —
CHECKED BY: GJL — DATE: 12/29/06	UXO 3 - CAUSEWAY STUMP NECK ANNEX NAVAL SUPPORT FACILITY, INDIAN HEAD INDIAN HEAD, MARYLAND	APPROVED BY: GJL — DATE: 12/29/06	
COST/SCHEDULE-AREA		APPROVED BY: — — DATE: —	
SCALE: AS NOTED		DRAWING NO.: FIGURE B-7	REV: 0

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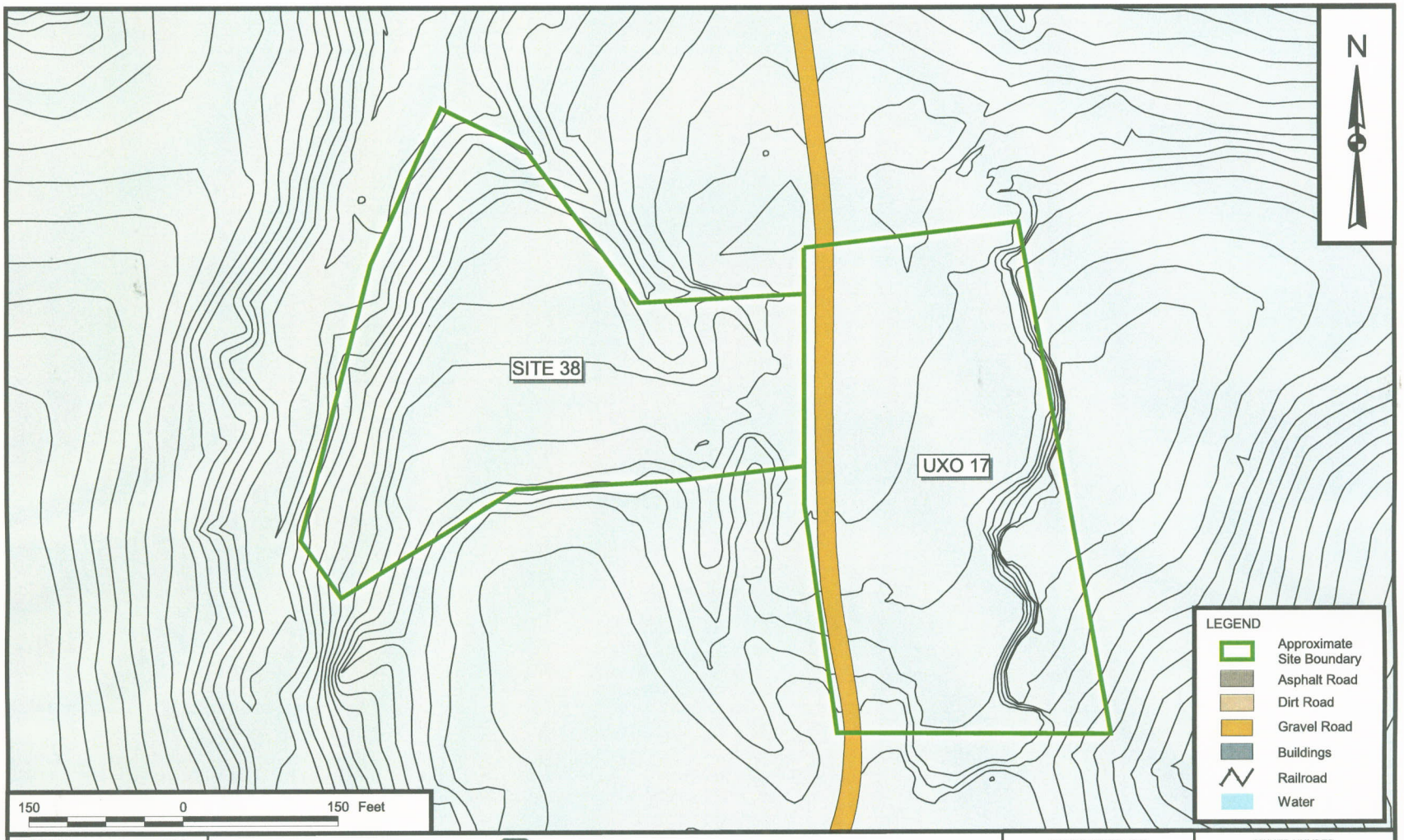

DRAWN BY: K. PEILA — DATE: 8/7/02	Tetra Tech NUS, Inc.	CONTRACT NUMBER: 2193	OWNER NUMBER: —
CHECKED BY: GJL — DATE: 12/29/06	SITE 38 - RUM POINT LANDFILL UXO 17 - SMALL ARMS (PISTOL) RANGE STUMP NECK ANNEX NAVAL SUPPORT FACILITY, INDIAN HEAD INDIAN HEAD, MARYLAND	APPROVED BY: GJL — DATE: 12/29/06	
COST/SCHEDULE-AREA		APPROVED BY: — — DATE: —	
SCALE: AS NOTED		DRAWING NO.: FIGURE B-8	REV: 0

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DRAWN BY: K. PEILA — DATE: 8/7/02	Tetra Tech NUS, Inc.	CONTRACT NUMBER: 2193	OWNER NUMBER: —
CHECKED BY: GJL — DATE: 12/29/06	SITE 58 - RANGE 3 BURN POINT AND SITE 59 - CHICAMUXEN CREEK'S EDGE SITE A STUMP NECK ANNEX NAVAL SUPPORT FACILITY, INDIAN HEAD INDIAN HEAD, MARYLAND	APPROVED BY: GJL — DATE: 12/29/06	
COST/SCHEDULE-AREA		APPROVED BY: — — DATE: —	
SCALE: AS NOTED		DRAWING NO.: FIGURE B-9	REV: 0

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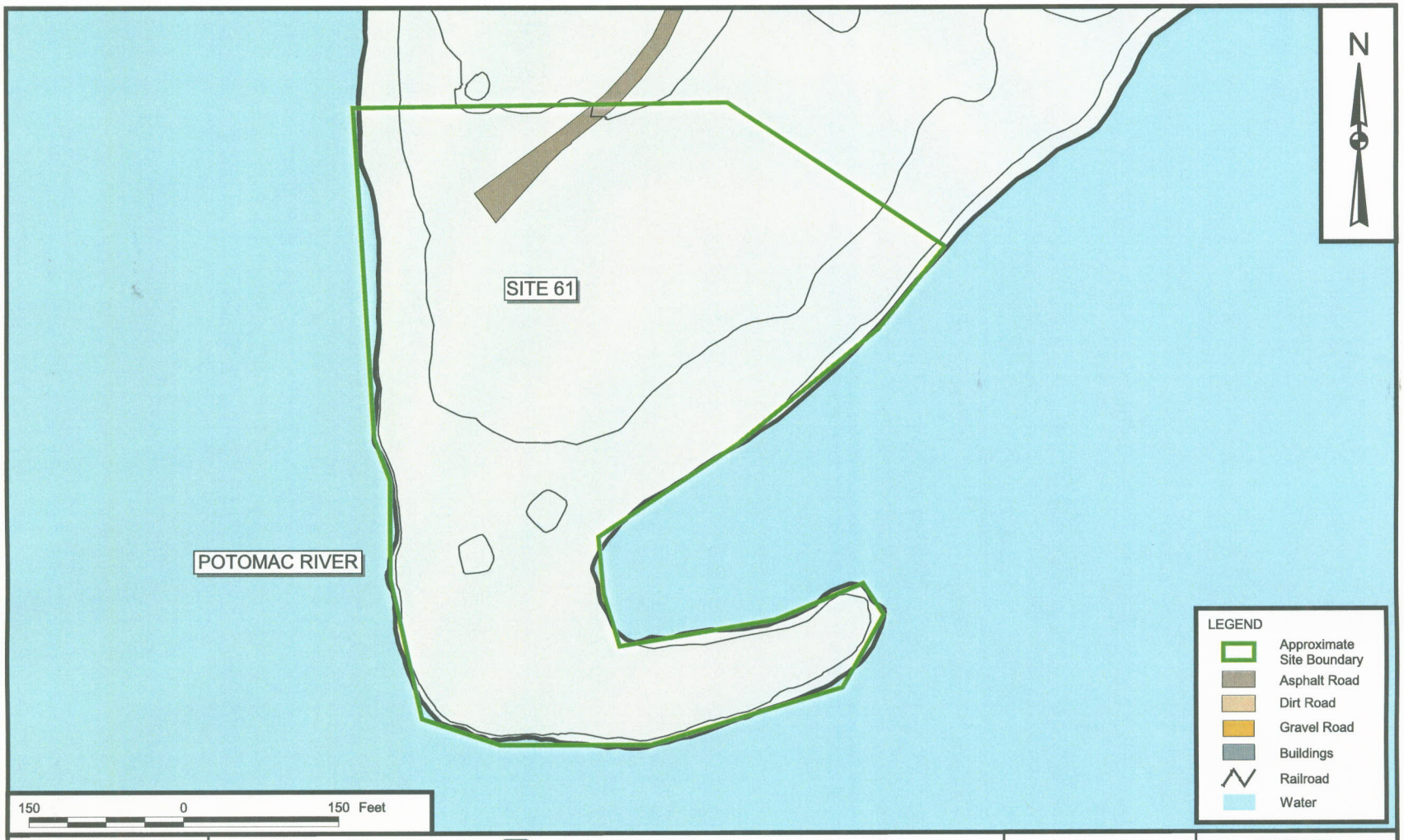

DRAWN BY: K. PEILA — DATE: 8/7/02	Tetra Tech NUS, Inc.	CONTRACT NUMBER: 2193	OWNER NUMBER: —
CHECKED BY: GJL — DATE: 12/29/06	SITE 61 - RANGE 6 STUMP NECK ANNEX NAVAL SUPPORT FACILITY, INDIAN HEAD INDIAN HEAD, MARYLAND	APPROVED BY: GJL — DATE: 12/29/06	
COST/SCHEDULE-AREA		APPROVED BY: — — DATE: —	
SCALE: AS NOTED		DRAWING NO.: FIGURE B-10	REV: 0

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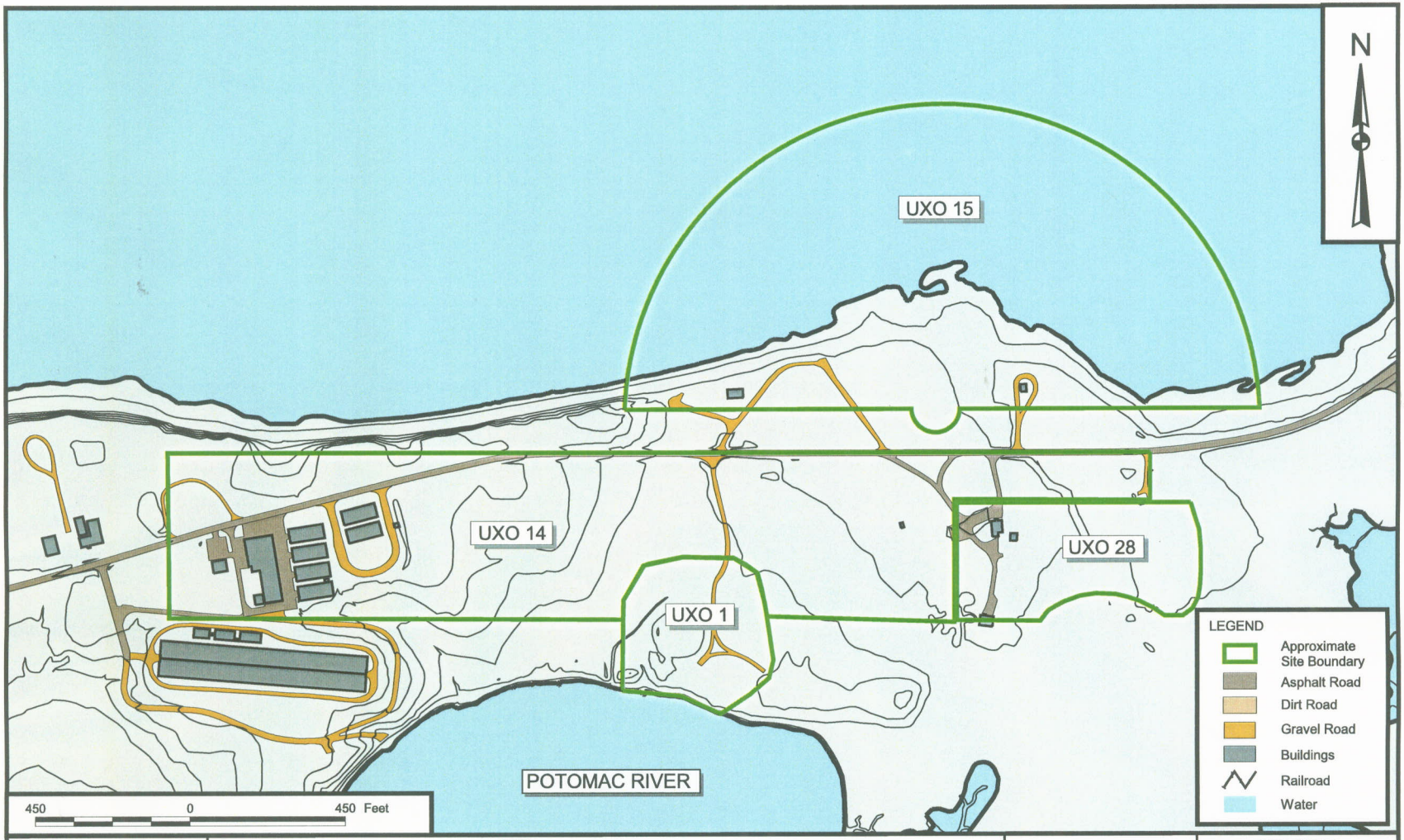

DRAWN BY: K. PEILA — DATE: 8/7/02	Tetra Tech NUS, Inc.	CONTRACT NUMBER: 2193	OWNER NUMBER: —
CHECKED BY: GJL — DATE: 12/29/06	UXO 1 - AIR BLAST POND UXO 14 - MARINE RIFLE RANGE UXO 15 - OLD SKEET AND TRAP RANGE UXO 28 - EOD SCHOOL DEMO AREA STUMP NECK ANNEX NAVAL SUPPORT FACILITY, INDIAN HEAD INDIAN HEAD, MARYLAND	APPROVED BY: GJL — DATE: 12/29/06	
COST/SCHEDULE-AREA		APPROVED BY: — — DATE: —	
SCALE: AS NOTED		DRAWING NO.: FIGURE B-11	REV: 0

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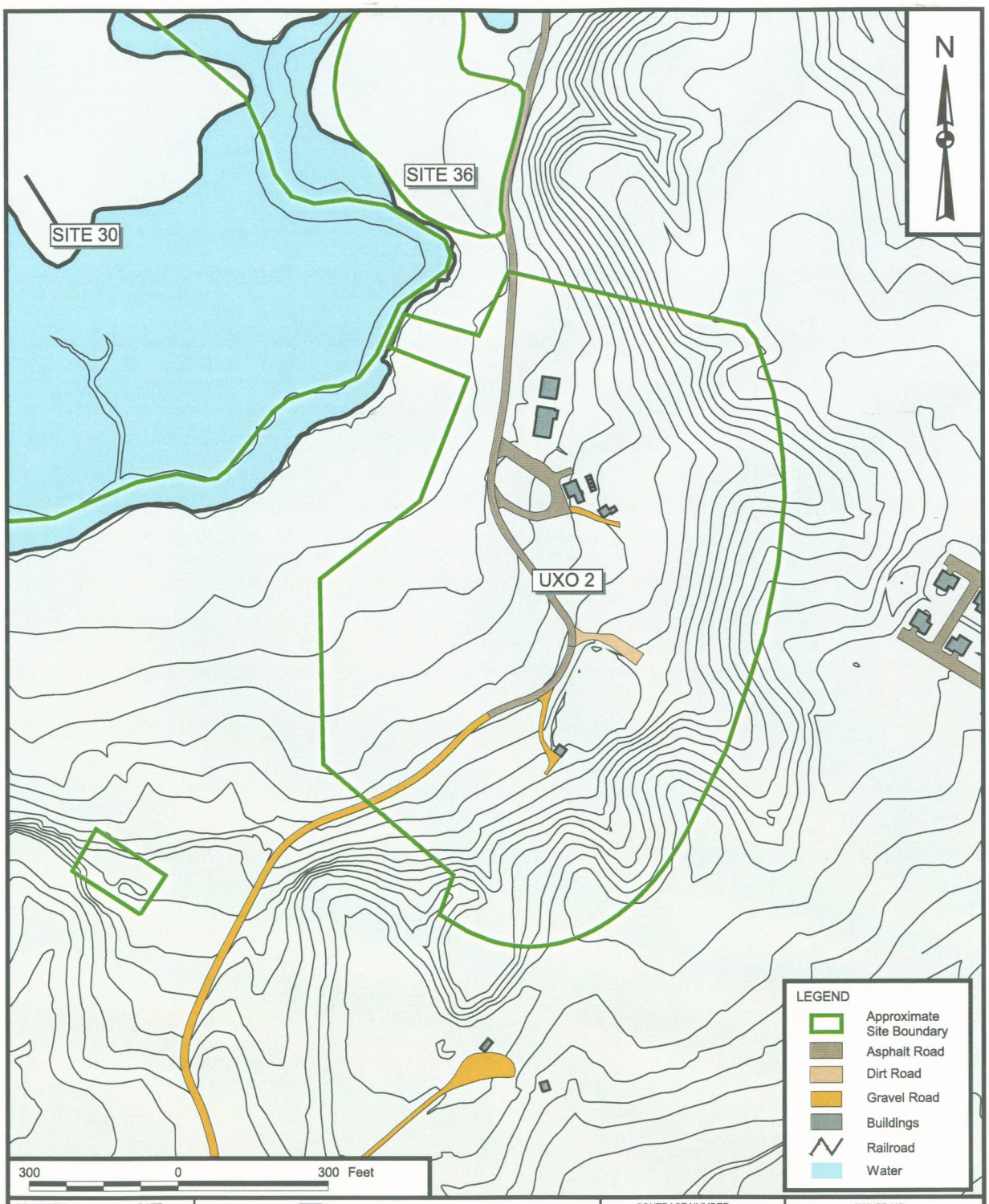

DRAWN BY: K. PEILA	DATE: 8/7/02	Tetra Tech NUS, Inc.	CONTRACT NUMBER: 2193 / OWNER NO.: —
CHECKED BY: GJL	DATE: 12/29/06	UXO 2 - AREA 8 STUMP NECK ANNEX NAVAL SUPPORT FACILITY, INDIAN HEAD INDIAN HEAD, MARYLAND	APPROVED BY: GJL / DATE: 12/29/06
COST/SCHEDULE-AREA			APPROVED BY: — / DATE: —
SCALE: AS NOTED			DRAWING NO.: FIGURE B-12 / REV: 0

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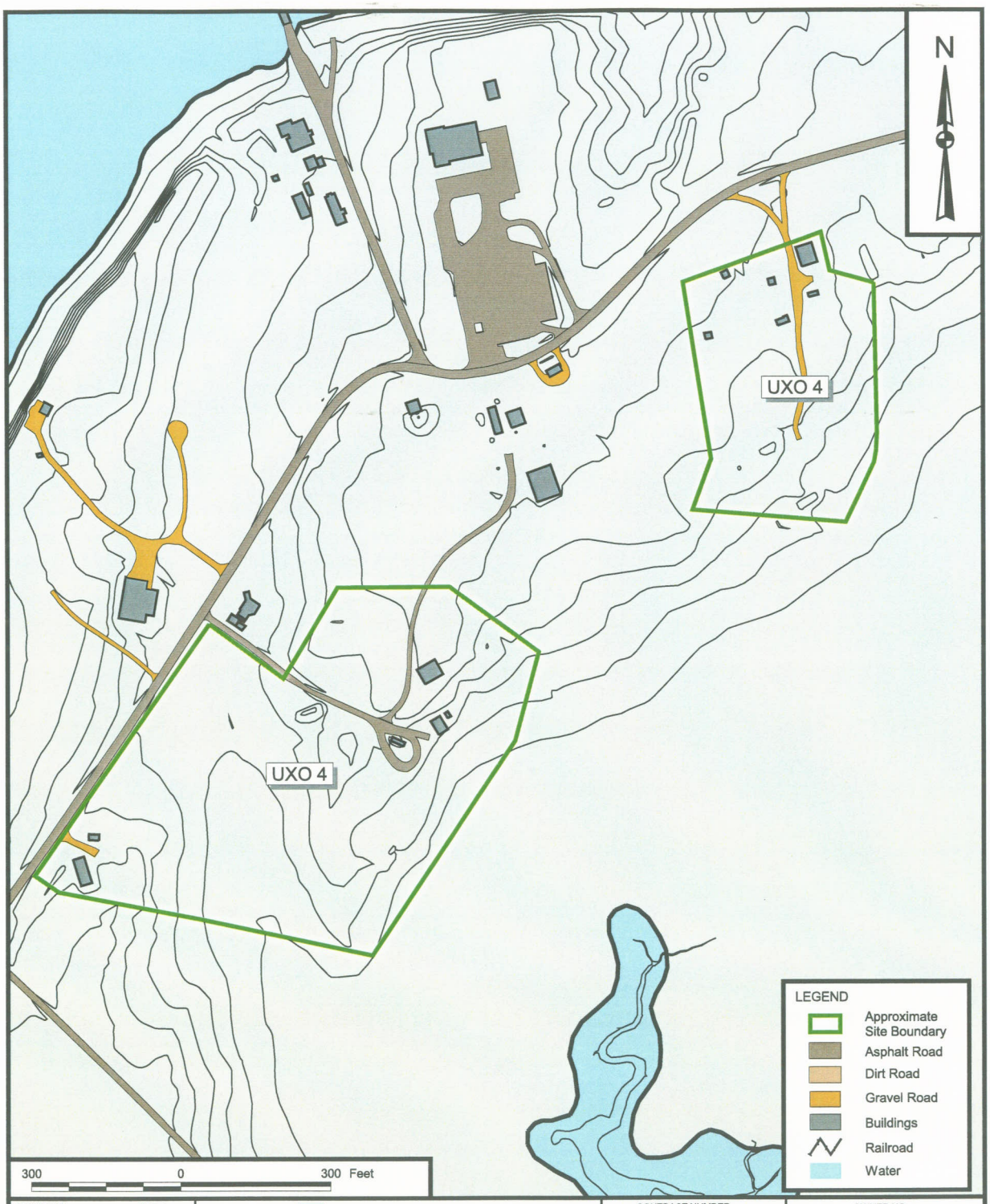

DRAWN BY: K. PEILA — DATE: 8/7/02	Tetra Tech NUS, Inc.	CONTRACT NUMBER: 2193	OWNER NO.: —
CHECKED BY: GJL — DATE: 12/29/06	UXO 4 - IED STUMP NECK ANNEX NAVAL SUPPORT FACILITY, INDIAN HEAD INDIAN HEAD, MARYLAND	APPROVED BY: GJL — DATE: 12/29/06	
COST/SCHEDULE-AREA		APPROVED BY: — — DATE: —	
SCALE: AS NOTED		DRAWING NO.: FIGURE B-13	REV: 0

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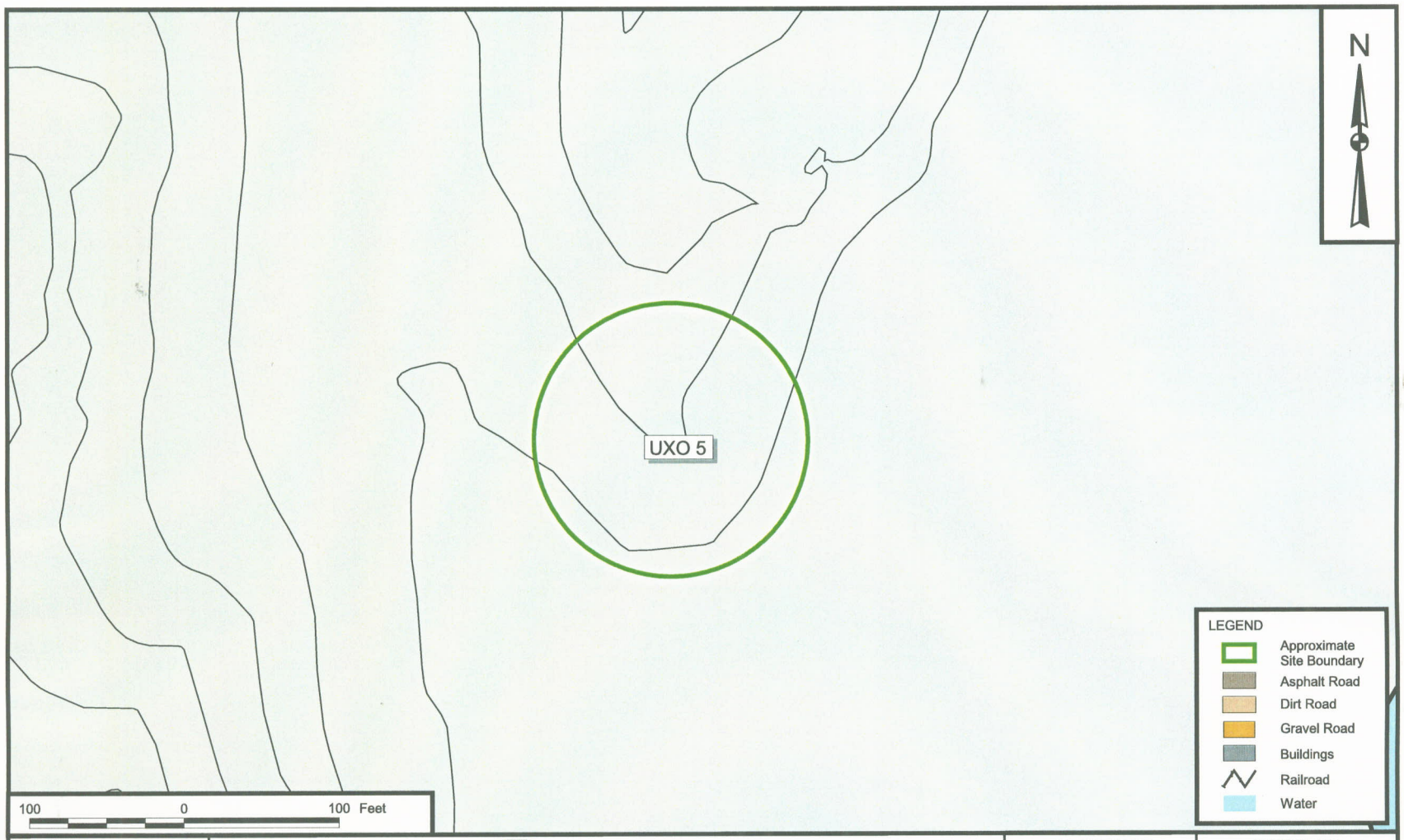
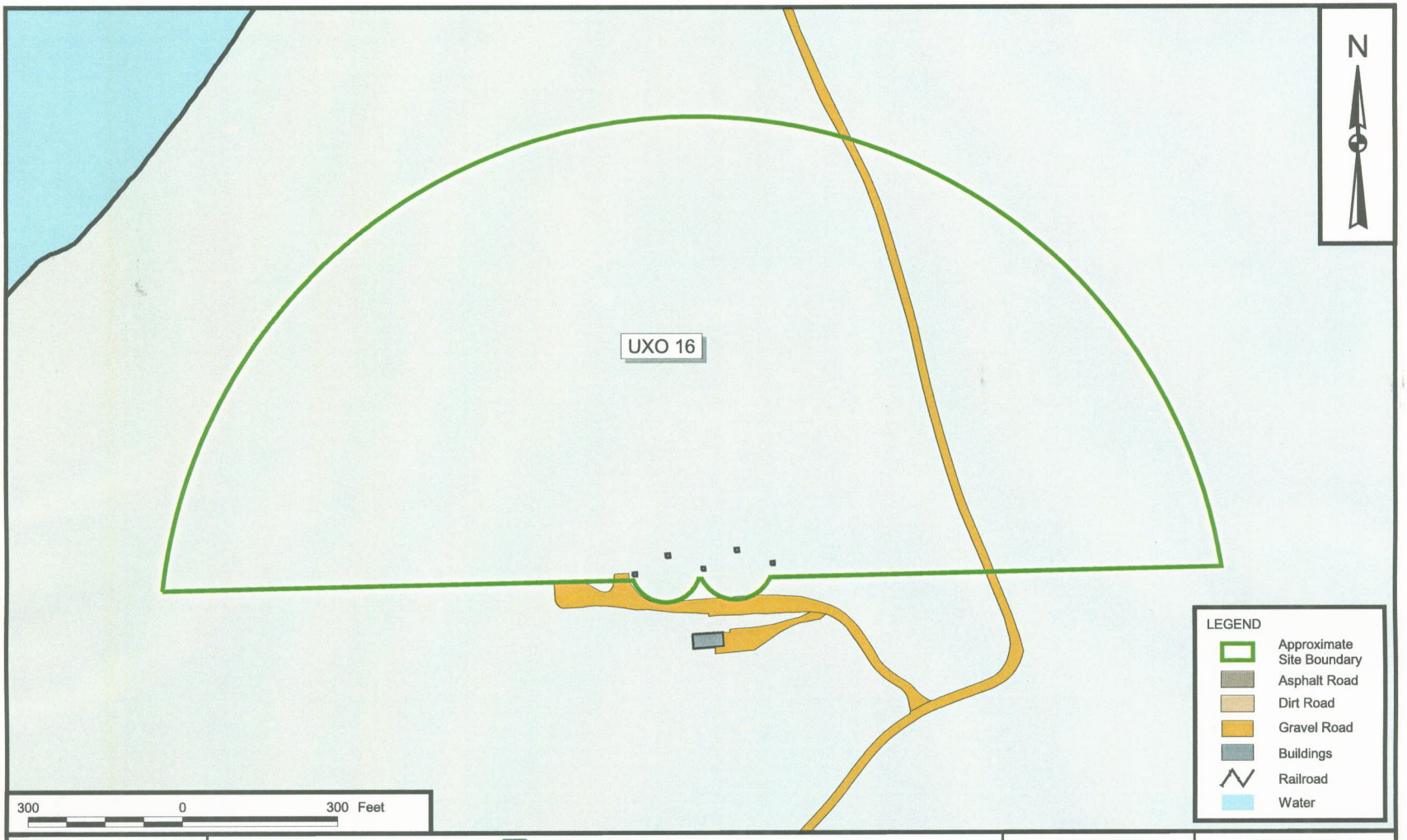


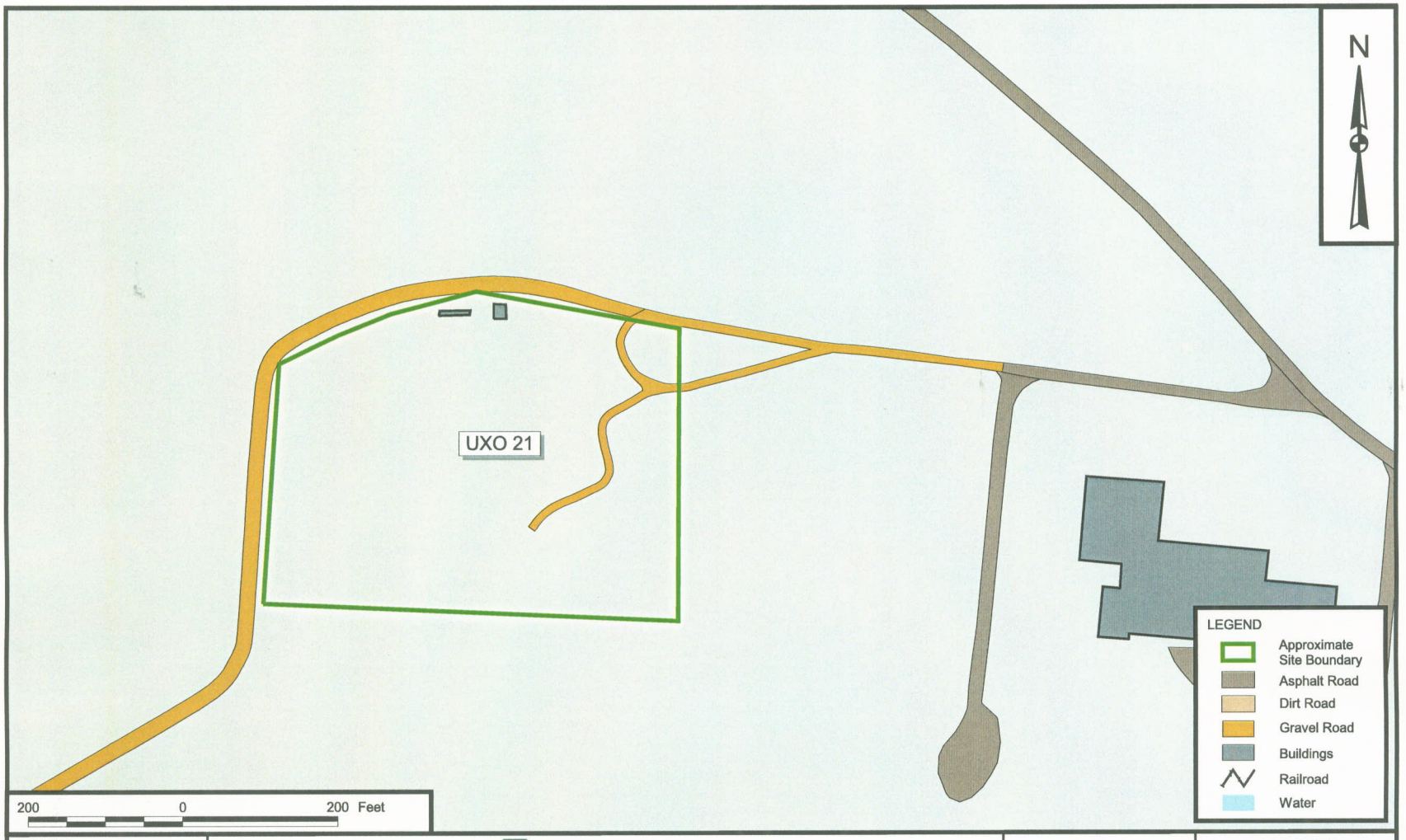
DRAWN BY: K. PEILA — DATE: 8/7/02	Tetra Tech NUS, Inc.	CONTRACT NUMBER: 2193	OWNER NUMBER: —
CHECKED BY: GJL — DATE: 12/29/06	UXO 5 - IOD STUMP NECK ANNEX NAVAL SUPPORT FACILITY, INDIAN HEAD INDIAN HEAD, MARYLAND	APPROVED BY: GJL — DATE: 12/29/06	
COST/SCHEDULE-AREA		APPROVED BY: — — DATE: —	
SCALE: AS NOTED		DRAWING NO.: FIGURE B-14	REV: 0

P:\GIS\INDIANHEAD_NSWC\APR\SITEMANAGEMENTPLAN.APR SN SITE 65 01/02/06 SS



DRAWN BY: K. PEILA — DATE: 8/7/02	Tetra Tech NUS, Inc.	CONTRACT NUMBER: 2193	OWNER NUMBER: —
CHECKED BY: GJL — DATE: 12/29/06	UXO 16 - RUM POINT SKEET RANGE STUMP NECK ANNEX NAVAL SUPPORT FACILITY, INDIAN HEAD INDIAN HEAD, MARYLAND	APPROVED BY: GJL — DATE: 12/29/06	
COST/SCHEDULE-AREA		APPROVED BY: — — DATE: —	
SCALE: AS NOTED		DRAWING NO.: FIGURE B-15	REV: 0

P:\GIS\INDIANHEAD_NSWC\APR\SITEMANAGEMENTPLAN.APR UXO 16 LAYOUT 01/11/07 SS



DRAWN BY: K. PEILA — DATE: 8/7/02	Tetra Tech NUS, Inc.	CONTRACT NUMBER: 2193	OWNER NUMBER: —
CHECKED BY: GJL — DATE: 12/29/06	UXO 21 - TEST AREA 1 STUMP NECK ANNEX NAVAL SUPPORT FACILITY, INDIAN HEAD INDIAN HEAD, MARYLAND	APPROVED BY: GJL — DATE: 12/29/06	
COST/SCHEDULE-AREA		APPROVED BY: — — DATE: —	
SCALE: AS NOTED		DRAWING NO.: FIGURE B-16	REV: 0

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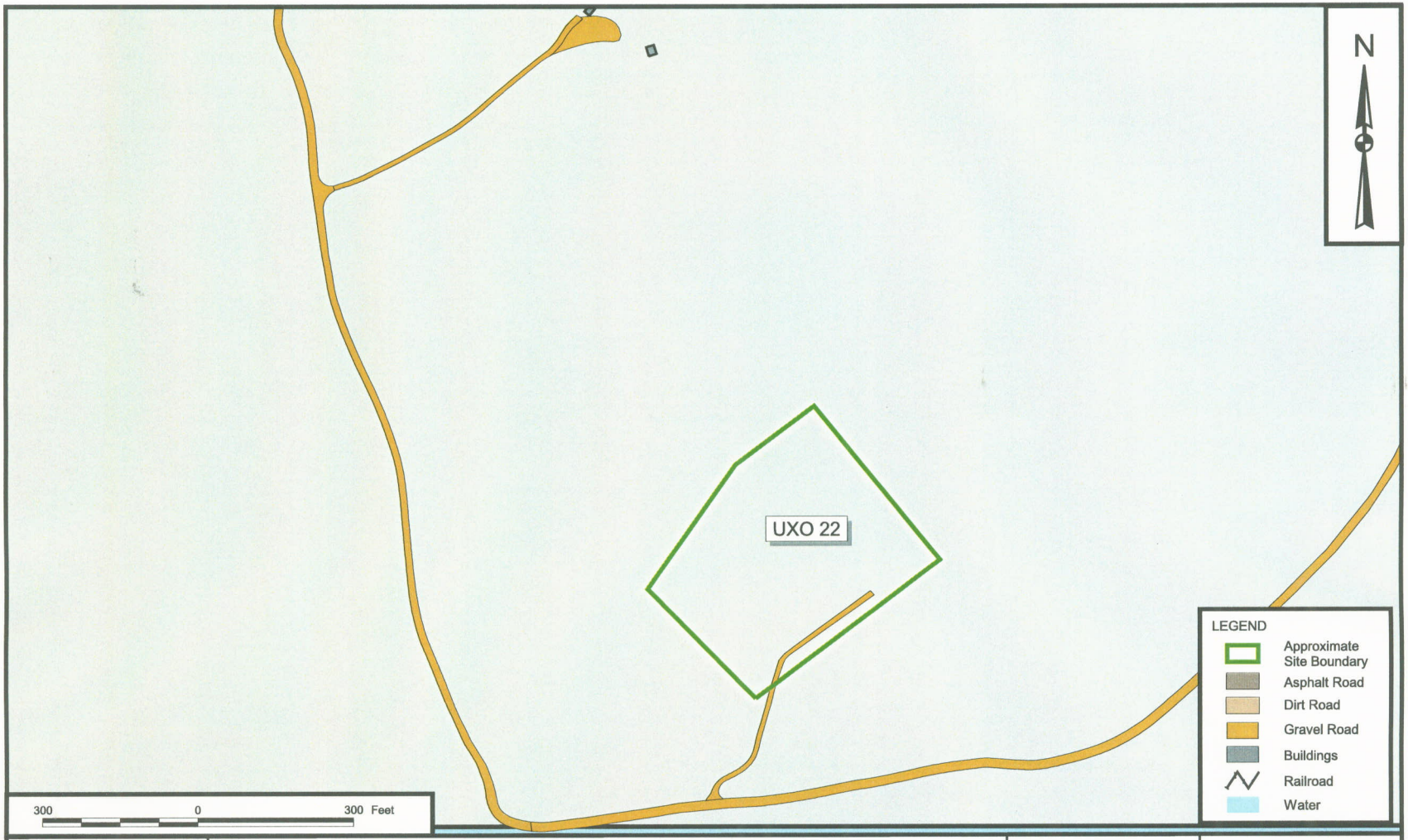
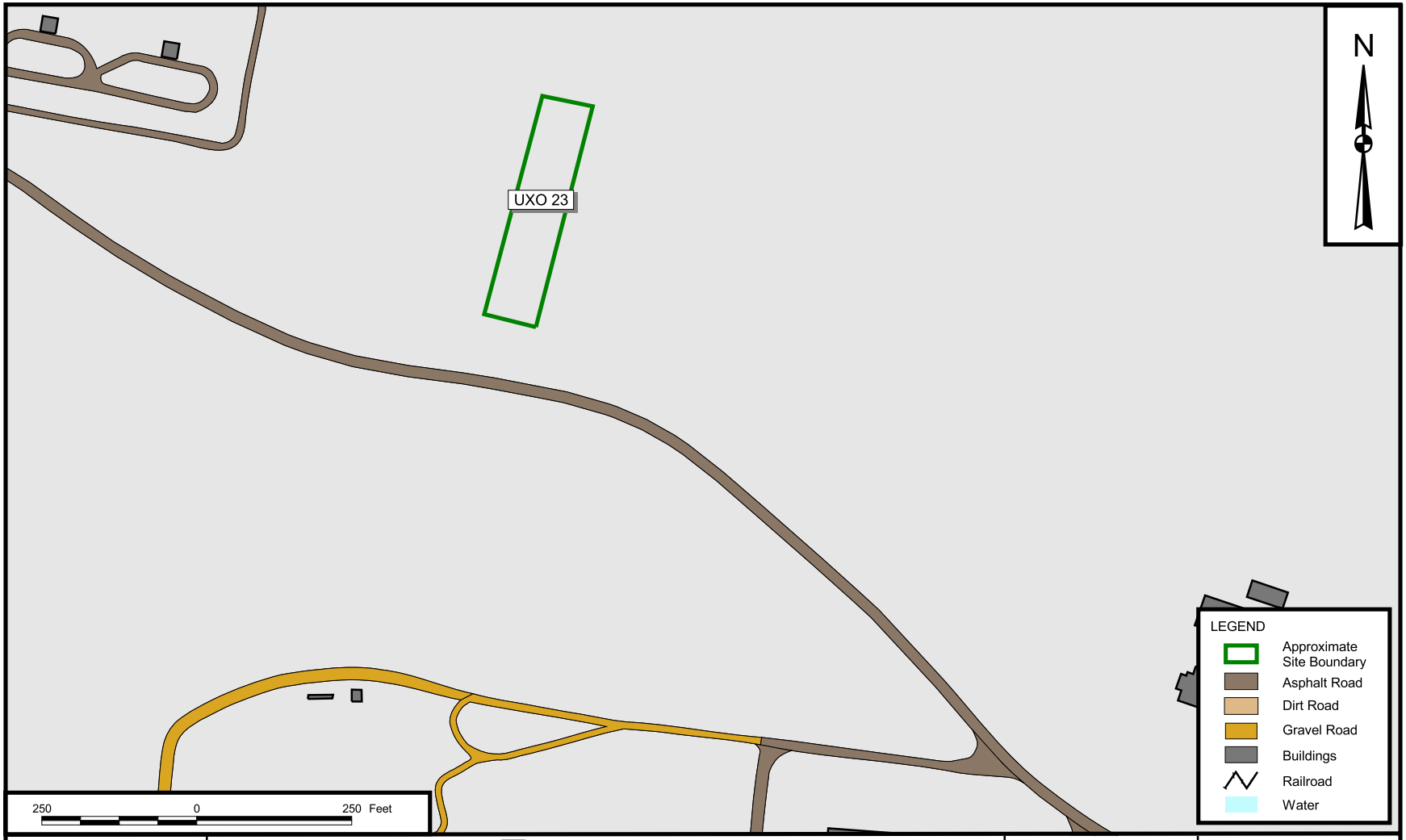


DRAWN BY: K. PEILA — DATE: 8/7/02	Tetra Tech NUS, Inc.	CONTRACT NUMBER: 2193	OWNER NUMBER: —
CHECKED BY: GJL — DATE: 12/29/06	UXO 22 - TEST AREA 2 STUMP NECK ANNEX NAVAL SUPPORT FACILITY, INDIAN HEAD INDIAN HEAD, MARYLAND	APPROVED BY: GJL — DATE: 12/29/06	
COST/SCHEDULE-AREA		APPROVED BY: — — DATE: —	
SCALE: AS NOTED		DRAWING NO.: FIGURE B-17	REV: 0

P:\GIS\INDIANHEAD_NSWC\APR\SITEMANAGEMENTPLAN.APR UXO 22 LAYOUT 01/11/07 SS



DRAWN BY: K. PEILA — DATE: 8/7/02	Tetra Tech NUS, Inc.	CONTRACT NUMBER: 2193	OWNER NUMBER: —
CHECKED BY: K. TURNBULL — DATE: 6/09/08	UXO 23 - TORPEDO CASING DISPOSAL AREA STUMP NECK ANNEX NAVAL SUPPORT FACILITY, INDIAN HEAD INDIAN HEAD, MARYLAND	APPROVED BY — DATE	
COST/SCHEDULE-AREA		APPROVED BY — DATE —	
SCALE: AS NOTED		DRAWING NO.: FIGURE B-18	REV: 0

P:\GIS\INDIANHEAD_NSWC\APR\SITEMANAGEMENTPLAN.APR UXO 23 LAYOUT 06/09/08 SS

DRAWN BY: K. PEILA — DATE: 8/7/02	Tetra Tech NUS, Inc.	CONTRACT NUMBER: 2193	OWNER NUMBER: —
CHECKED BY: GJL — DATE: 12/29/06	UXO 25 - ROACH ROAD RIFLE RANGE STUMP NECK ANNEX NAVAL SUPPORT FACILITY, INDIAN HEAD INDIAN HEAD, MARYLAND	APPROVED BY: GJL — DATE: 12/29/06	
COST/SCHEDULE-AREA		APPROVED BY: — — DATE: —	
SCALE: AS NOTED		DRAWING NO.: FIGURE B-19	REV: 0

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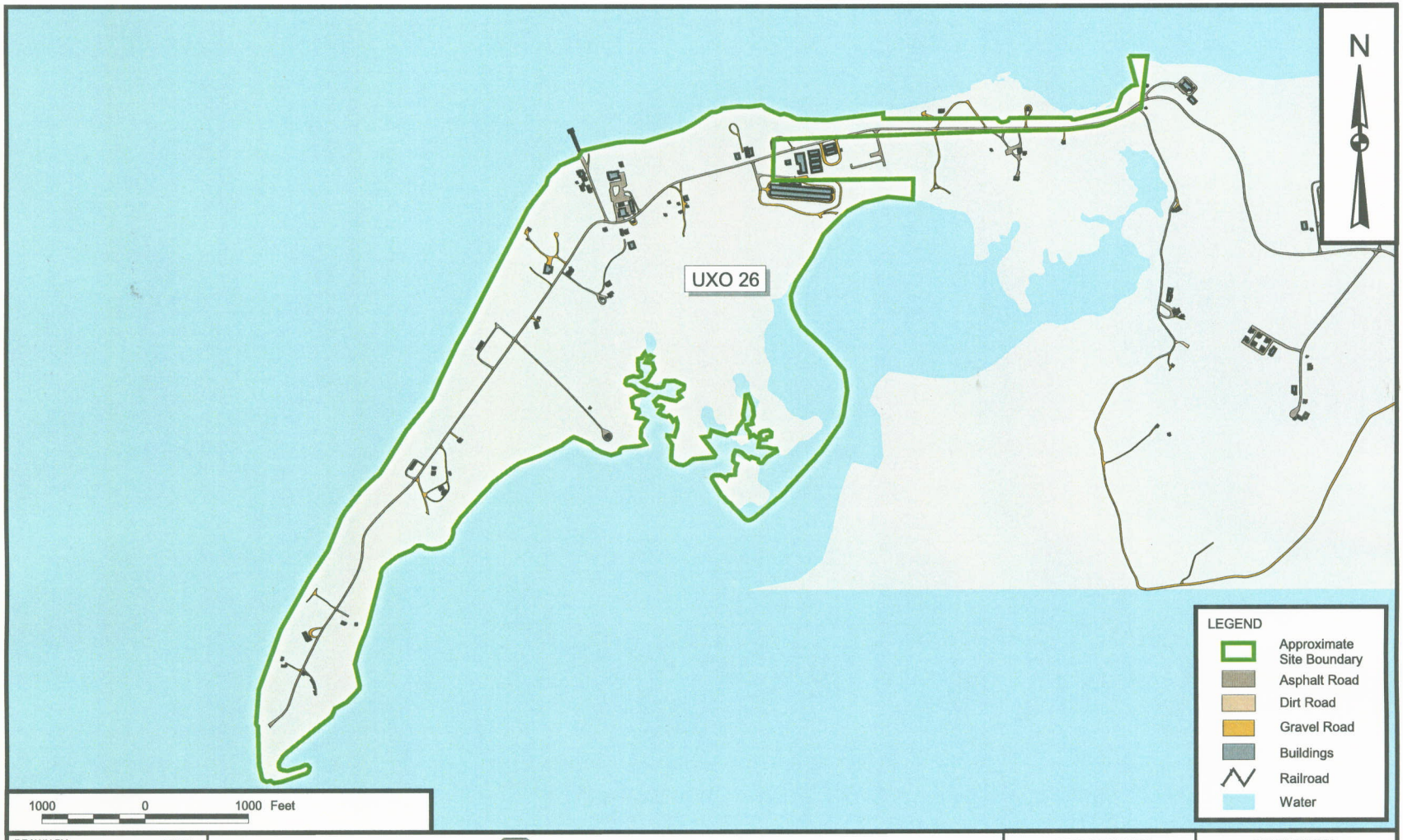

DRAWN BY: K. PEILA — DATE: 8/7/02	Tetra Tech NUS, Inc.	CONTRACT NUMBER: 2193	OWNER NUMBER: —
CHECKED BY: GJL — DATE: 12/29/06	UXO 26 - THE VALLEY IMPACT AREA STUMP NECK ANNEX NAVAL SUPPORT FACILITY, INDIAN HEAD INDIAN HEAD, MARYLAND	APPROVED BY: GJL — DATE: 12/29/06	
COST/SCHEDULE-AREA		APPROVED BY: — — DATE: —	
SCALE: AS NOTED		DRAWING NO.: FIGURE B-20	REV: 0

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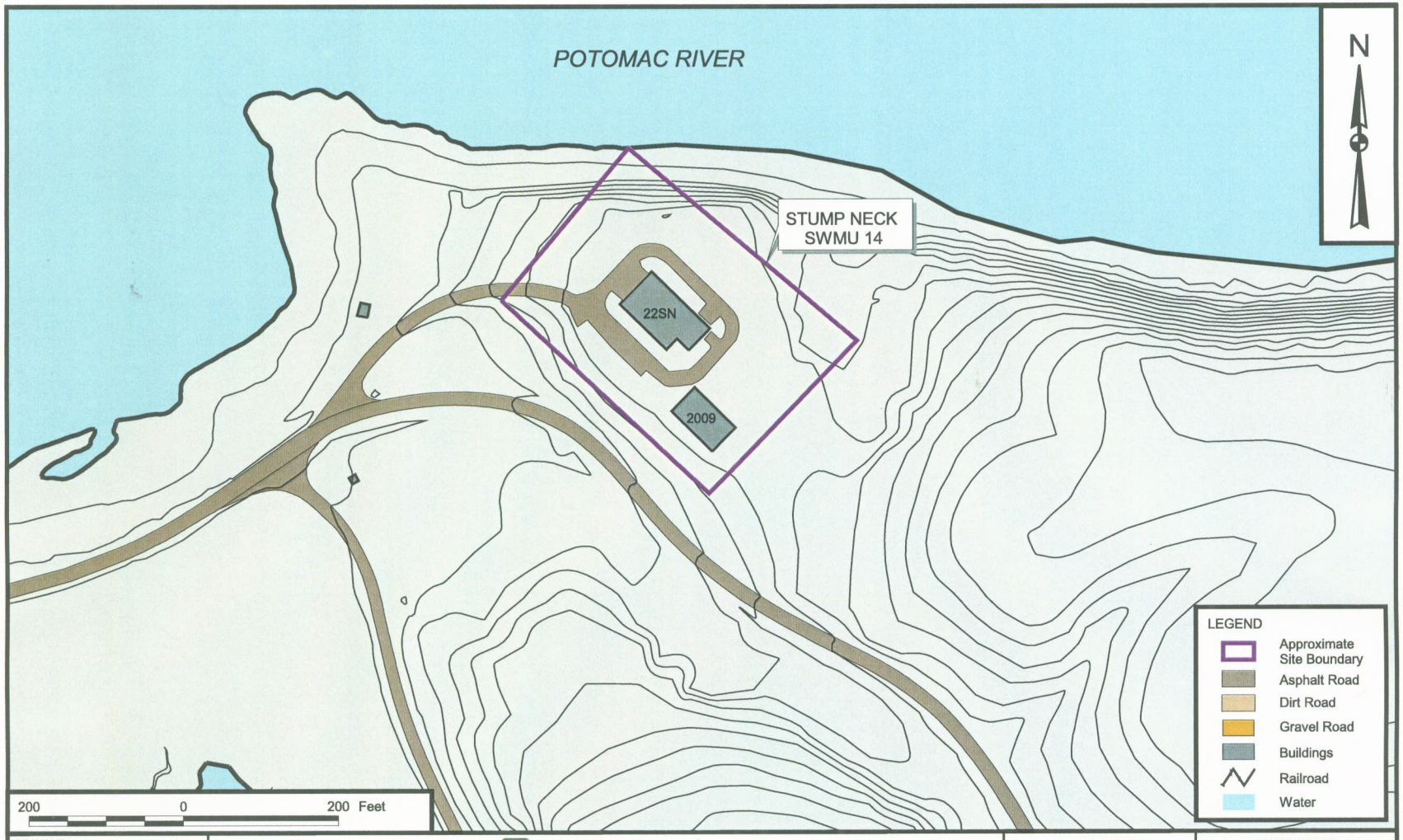

DRAWN BY: K. PEILA — DATE: 8/7/02	Tetra Tech NUS, Inc.	CONTRACT NUMBER: 2193	OWNER NUMBER: —
CHECKED BY: GJL — DATE: 12/29/06	SWMU 14 - PHOTOGRAPHIC LAB SEPTIC SYSTEM STUMP NECK ANNEX NAVAL SUPPORT FACILITY, INDIAN HEAD INDIAN HEAD, MARYLAND	APPROVED BY: GJL — DATE: 12/29/06	
COST/SCHEDULE-AREA		APPROVED BY: — — DATE: —	
SCALE: AS NOTED		DRAWING NO.: FIGURE B-21	REV: 0

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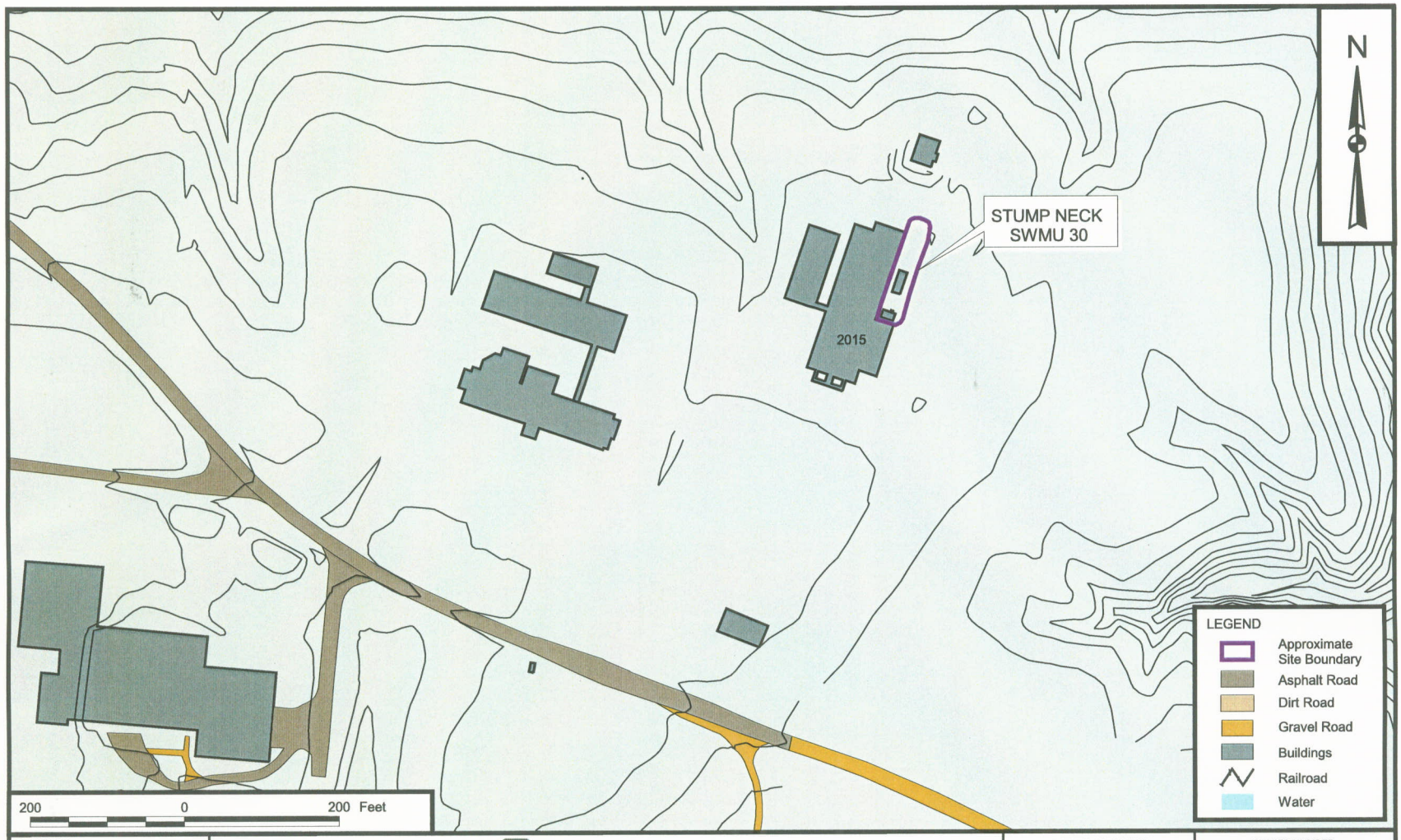

DRAWN BY: K. PEILA — DATE: 8/7/02	Tetra Tech NUS, Inc.	CONTRACT NUMBER: 2193	OWNER NUMBER: —
CHECKED BY: GJL — DATE: 12/29/06	SWMU 30 - BUILDING 2015 DRY WELL STUMP NECK ANNEX NAVAL SUPPORT FACILITY, INDIAN HEAD INDIAN HEAD, MARYLAND	APPROVED BY: GJL — DATE: 12/29/06	
COST/SCHEDULE-AREA		APPROVED BY: — — DATE: —	
SCALE: AS NOTED		DRAWING NO.: FIGURE B-22	REV: 0

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APPENDIX C

Photo Log

Site Management Plan
Photographic Log
for
Installation Restoration Program
Naval Support Facility Indian Head

Indian Head, Maryland

REVISED:
June 2010

TABLE C-1

PHOTO INDEX
INSTALLATION RESTORATION PROGRAM AND MUNITIONS RESPONSE PROGRAM SITES
MAIN AREA AND STUMP NECK ANNEX
NSF-IH, INDIAN HEAD, MARYLAND
PAGE 1 OF 2

IR Site ID	SWMU ID	MRP UXO ID	Name of IR Site	Main Area (MA)/ Stump Neck (SN)	PHOTO LOG PAGE No.
1			Thorium Spill	MA	1
2			Waste Crank Case Oil Applied to Torrence Road	MA	3
3			Nitroglycerin Explosion, Nitration Building Area	MA	4
4			Lloyd Road Oil Spill Sites	MA	5
5			X-Ray Building 731	MA	7
6			Building 1349, Hypo Spill, Radiographic Facility Accelerator	MA	8
7			Building 682, HMX Spill	MA	10
8			Building 766, Mercury Deposits	MA	11 & 95
9			Patterson Avenue, Oil Spill	MA	12
10		9	Single-base Propellant Grains Spill	MA	120
11			Caffee Road Landfill	MA	13
12			Town Gut Landfill	MA	16
13			Paint Solvents Disposal Ground	MA	19
14			Waste Acid Disposal Pit	MA	21
15			Mercury Deposits in Manhole, Fluorine Lab	MA	22
16			Laboratory Chemical Disposal	MA	none
17			Disposed Metal Parts Along Shoreline	MA	23
18			Hog Island	MA	24
19			Catch Basins at Chip Collection Houses	MA	33
20			Single-base Powder Facilities	MA	35
21			Bronson Road Landfill	MA	36
22		6	NG Slums Burning Site	MA	113
23			Hydraulic Oil Spill Discharges From Extrusion Plant	MA	39
24			Abandoned Drain Lines	MA	40
25			Hypo Discharge X-Ray Building No. 2	MA	43
26			Thermal Destructor 2	MA	45
27			Thermal Destructor 1	MA	46
28		8	Original Burning Ground	MA	115
29		11	The Valley	MA	124
30	22	10	Stump Neck Impact Area	SN	122
31	23	7	Old Demolition Range	SN	114
32	11		Suspected Tool Burial Site	SN	none
33	7		Scrap Metal Pit	SN	47
34	8		Tool Burial Site	SN	none
35	9	12	Torpedo Burial Site	SN	124
36	10		Closed Landfill	SN	48
37	24	3	Causeway	SN	49
38	1		Rum Point Landfill	SN	50
39			Silver Release to Sediments	MA	62
40			Palladium Catalyst in Sediments	MA	63
41		32	Scrap Yard	MA	140
42			Olsen Road Landfill	MA	65
43			Toluene Disposal Site	MA	67
44			Soak Out Area	MA	69
45			Abandoned Drums	MA	70
46			Cadmium Sandblast Grit	MA	71
47			Mercuric Nitrate Disposal Area	MA	73

TABLE C-1

PHOTO INDEX
INSTALLATION RESTORATION PROGRAM AND MUNITIONS RESPONSE PROGRAM SITES
MAIN AREA AND STUMP NECK ANNEX
NSF-IH, INDIAN HEAD, MARYLAND

IR Site ID	SWMU ID	MRP UXO ID	Name of IR Site	Main Area (MA)/ Stump Neck (SN)	PHOTO LOG PAGE No.
48			Nitroglycerin Plant Disposal Area	MA	82
49			Chemical Disposal Pit	MA	83
50			Building 103, Crawl Space	MA	84
51			Building 101, Dry Well	MA	85
52			Building 102, Dry Well	MA	87
53			Mercury Contamination of the Sewage System	MA	89
54			Building 101	MA	85
55			Building 102	MA	87
56			IW87 - Lead Contamination	MA	91
57			TCE Building 292 Area	MA	97
58	2		Range 3 Burn Point	SN	none
59	3		Chicamuxen Creek's Edge Site A	SN	none
60	4		Chicamuxen Creek's Edge Site B	SN	none
61	5		Range 6	SN	none
62	6	1	Air Blast Pond	SN	109
63	25	2	Area 8	SN	110
64	26	4	IED (+SN SWMU 19)	SN	111
65	27	5	IOD	SN	112
66			Turkey Run Disposal Area	MA	100
67			Hog Out Facility	MA	none
		13	FDR Skeet Range	MA	126
		14	Marine Rifle Range	SN	127
	28	15	Old Skeet and Trap Range (+SN SWMU 20)	SN	128
		16	Rum Point Skeet Range	SN	129
	29	17	Small Arms (Pistol) Range	SN	130
		18	Battle Range Firing (Water Site)	SN	none
		19	Igniter Area - (Water Site)	MA	none
	20	20	Safety Thermal Treatment Point	MA	131
		21	Test Area 1	SN	132
		22	Test Area 2	SN	133
		23	Torpedo Casing Disposal Area	SN	134
		24	Water Impact Area - (Water Site)	MA	none
		25	Roach Road Rifle Range	SN	135
		26	The Valley Impact Area	SN	136
		27	Sonar Training Area (Water Site)	SN	none
		28	EOD School Demo Area	SN	137
		29	Southwestern Pistol Range	MA	138
		30	Gate 3 Burning Ground	MA	139
		31	Pope's Creek (Water Site)	--	none
	14		Photographic Lab Septic Tank System		143
	30		Building 2015 Dry Well		146

Site 1 – Looking east from Torrence Road. (2004)

Site 1 – Looking southeast from the parking lot on northwest side of Building 900. (2004)

Site 1 – Looking northeast from the eastern corner of Building 1662. (2004)

Site 1 – Looking north from southeast of Building 1662. (2004)

Site 2 – Looking south along Torrence Road. (1995)

Site 3 – Looking southeast from the side of Travers Road at former Building area. (1995)

Site 4 – Former dumpster location facing northwest. (2004)

Site 4 – Looking forward northwest. (2004)

Site 4 – Looking toward north. (2004)

Site 5 – Looking northwest, across the lower swale from the dirt road. (1995)

Site 5 – Looking northeast from the swale bend up toward Building 731. (1995)

Site 6 – Looking north from grassy area south of Building 1349. (1995)

Site 6 – Looking east down channel from above the CMP south of Building 1349. (1995)

Site 6 – Looking east from concrete driveway up at open drainage grate. (1995)

Site 7 – Looking west at tank and Building 682 from grassy area near stream channel. (1995)

Site 7 – Looking north from grassy area at tank, sign, and stream channel in background. (1995)

Site 8 – Looking south from above the rip-rap and RCP. (1995)

Site 9 – Looking east from in front of asphalt turnaround, West of Building 320. (1995)

Site 11 – Looking south from the top of the drive leading into the landfill. (1995)

Site 11 – Looking southeast from the top of the drive leading into the landfill. (1995)

Site 11 – Looking east along the Mattawoman Creek bank of south of the landfill. (1995)

Site 11 – Looking at the sign positioned at the top of the drive leading into the landfill. (1995)

Site 11 – Looking northwest up the stream located west of the landfill. (1995)

Site 12 – Looking northwest from Atkins Road Extension. (2004)

Site 12 – Looking north from Atkins Road Extension. (2004)

Site 12 – Looking north from Atkins Road Extension. (2004)

Site 12 – Looking south from Atkins Road Extension. (2005)

Site 12 – Looking south from Atkins Road Extension (2004)

Site 13 – Looking southwest from the north side of Building 1753.

Site 13 – Looking south-southwest from north of Building 1753.

Site 13 – Looking west-southwest from north of Building 1753.

Site 13 – Looking west from directly behind Building 1753. (1995)

Site 14 (Lab Area) – Looking east from the top of the grassy-bank, from the northwest corner of Building 881. (1995)

Site 15 (Lab Area) – Looking southeast from directly in front of Pump Station 502. (1995)

Site 15 (Lab Area) – Looking northwest at concrete manhole cover from the southeastern side of McMahon Road. (1995)

Site 17 – Looking northeast from grassy area at larger dump area southeast of Building 1569. (1995)

Site 17 – Looking northeast from larger dump area at smaller dump area southeast of Building 1569. (1995)

Site 18 – Looking north into grassy area toward Atkins Road. (1995)

Site 18 – Looking toward south and Mattawoman Creek. (2005)

Site 18 – Looking toward northeast across cattails. (2005)

Site 18 – From top of Hog Island looking toward east-northeast. (2005)

Site 18 – From top of Hog Island looking toward northwest (2005)

Site 18 - From top of Hog Island looking toward west-northwest. (2005)

Site 18 – From top of Hog Island looking toward north. (2005)

Site 18 – Looking southwest uphill toward top of Hog Island. (2005)

Site 18 – Looking south along the shore of Hog Island toward Mattawoman Creek. (2005)

Site 18 – Looking southeast from shore of Hog Island toward Mattawoman Creek. (2005)

Site 18 – Looking toward the east from the center of the site. (2005)

Site 18 – Looking from the southern edge of Site 18 toward the south-southwest across cattails. (2005)

Site 18 – Looking south from the southern edge of Site 18 across cattails toward Mattawoman Creek. (2005)

Site 18 – Looking southwest from road through gate to the site. (2005)

Site 18 – Looking north at pile of debris on the northern edge of the site. (2005)

Site 18 – Looking from the site toward the northeast and the gate to the site. (2005)

Site 18 – Looking from the site toward the west. (2005)

Site 19 – Looking from inside Building 1051 down into drainage outlet. (1995)

Site 19 – Looking northeast at the Building 1051 discharge point above the stream. (1995)

Site 19 – Looking northeast from directly above the discharge pipe behind Building 785. (1995)

Site 20 – Looking north from the parking lot in front of Building 163. (1995)

Site 21 – Looking west from top of landfill toward Bronson Road. (1995)

Site 21 – Looking southeast from the northwest corner of the landfill along Bronson Road. (2005)

Site 21 – Looking southeast from a location across the street from Building 1384 on Bronson Road. (2005)

Site 21 - Looking northeast from the southern end of the grass-covered dirt road on the landfill. (2005)

Site 21 – Looking east from the southern end of the grass-covered dirt road on the landfill. (2005)

Site 21 - Looking north from the southern end of the grass-covered dirt road on the landfill. (2005)

Site 23 – Looking southeast at concrete manhole cover from the northern side of Hersey Road. (1995)

Site 24 – Looking northwest up Thomas Road at the intersection of Hersey Road and Thomas Road. (2005)

Site 24 - Looking southeast towards Building 292 from Building 167. (2005)

Site 24 – Looking north along the west side of Thomas Road. (2005)

Site 24 – Looking west from Thomas Road at Building 167 (former ether vault) and Building 166 (alcohol storehouse). (2005)

Site 24 - Looking south from Building 295A towards Building 164 along the Single-Base Line. (2005)

Site 25 – Looking northeast into drainage pipe from asphalt driveway. (Pipe is located in the right corner, under the striped warning tape.) (1995)

Site 25 – Looking east from on top of Sidney Way down into stream bed. (1995)

Site 26 – Looking northwest from the edge of the gravel road in front of Building 1596. (1995)

Site 27 – Looking west from the western edge of the asphalt road. (1995)

Site 33 – Looking east from fence. (2004)

Site 33 – Looking northwest toward southeast side of Building 2116. (2004)

Site 36 – Looking east toward abandoned tank. (2004)

Site 36 – Looking north toward abandoned machinery. (2004)

Site 37 – Looking south along Causeway. (2010)

Site 37 – Looking north on shoreline along Causeway. (2010)

Site 38 – Looking west from Rum Point road. (2004)

Site 38 – Looking west from East side of landfill. (2004)

Site 38 – Debris at toe of slope. (2004)

Site 38 – Debris on slope. (2004)

Site 38 – Monitoring well. (2004)

Site 38 – Landfill slope. (2004)

Site 38 – Waste on landfill slope. (2004)

Site 38 – Waste on landfill slope. (2004)

Site 38 – Debris on landfill slope. (2004)

Site 38 – Monitoring well. (2004)

Site 38 – Debris on landfill slope. (2004)

Site 38 – Debris on landfill slope. (2004)

Site 38 – Top of Landfill slope. (2004)

Site 38 – Landfill debris. (2004)

Site 38 – Landfill debris. (2004)

Site 38 – Landfill debris. (2004)

Site 38 – Landfill debris. (2004)

Site 38 – Landfill debris. (2004)

Site 38 – Landfill debris. (2004)

Site 38 – Landfill debris. (2004)

Site 38 – Gully along Northeast side of landfill. (2004)

Site 38 – Area at bottom of Northeast landfill slope. (2004)

Site 38 – Gully on East side of landfill. (2004)

Site 39 – Looking south through fence from dirt road above pipe. (1995)

Site 39 – Looking east through fence from dirt road above pipe. (1995)

Site 40 – Looking east through fence from dirt road above pipe. (1995)

Site 40 – Looking south through fence from dirt road above pipe. (1995)

Site 39 & 40 – Looking west at outfall area from man-made jetty located behind scrap yard. (1995)

Site 42 – Looking northeast at drainage swale northwest of Building 1866. (2006)

Site 42 – Looking southeast across landfill slope from northwest end of landfill. (2006)

Site 42 – Looking southeast across landfill slope from the center of the landfill. (2006)

Site 42 – Looking southeast along unnamed stream along the toe of the landfill slope. (2006)

Site 43 (1041) – Looking toward northeast along Gallery Road. (1994)

Site 43 (1040) – Looking toward southeast. (1994)

Site 43 (1040) – Looking at northwest side of Building 1040 and Schuyler Road. (1994)

Site 44 – Looking northwest from the western berm of Boyd Road. (1995)

Site 45 – Looking northwest from directly in front of the drum collection. (1995)

Site 46 – Looking northeast from the sidewalk toward the area adjacent to Building 1280. (1995)

Site 46 – Looking east into grassy area between the wooded area and the sidewalk. (1995)

Site 46 – Looking northwest from the southwest side of Building 855. (1994)

Site 46 – Looking northwest from southwest side of Building 855. (2005)

Site 47 – Looking south from Building 856 along the drainage ditch.

Site 47 – Looking southeast along the lower end of the drainage ditch from Building 856.

Site 47 – Looking north towards Building 856 with the drainage ditch on the right.

Site 47 – Looking northeast towards Building 856.

Site 47 – Looking northeast towards the beginning of the drainage ditch at Building 856.

Site 47 – Looking north towards Building 856.

Site 47 – Looking southeast at drainage ditch from Building 856.

Site 47 – Looking south-southeast at drainage ditch from Building 856.

Site 47 – Looking west at drainage ditch.

Site 47 – Looking at Industrial Wastewater Outfall 91 (IW91) located north-northwest of Building 856 which previously use to receive discharges from Building 856.

Site 47 – Looking northwest towards the Potomac River from the southwestern corner of Building 856.

Site 47 – Looking southeast towards the rear of Building 856.

Site 47 – Looking south towards the rear of Building 856 from Building 857.

Site 47 – Looking southeast towards Building 856 and IW91 (manhole).

Site 47 – Looking at lower end of drainage ditch from Building 856.

Site 47 – Looking northeast directly in front of the thermal destructor on the west side of Building 856. (1995)

Site 47 – Looking northeast up the grassy swale from the edge of Boyd Road. (1995)

Site 47 – Looking northwest up the grassy swale from the edge of the asphalt parking lot in front of Building 856. (1995)

Site 48 – Looking south from site boundary, approximately 70 foot south of Site 8. (1995)

Site 48 – Looking north from site boundary. (1995)

Site 49 (Lab Area) – Looking east from grassy area west of Building 444. (1995)

Site 49 (Lab Area) – Looking directly down onto Site 49 manhole. (1995)

Site 50 (Lab Area) – Looking east from front of Building 103. (1995)

Site 50 (Lab Area) – Looking west from rear of Building 103. (1995)

Site 51 & 54 (Lab Area) – Looking east toward Building 101 (1995)

Site 51 & 54 (Lab Area) – Looking south toward Building 101. (1995)

Site 51 & 54 (Lab Area) – Looking west toward Building 101. (1995)

Site 51 & 54 (Lab Area) – Looking north toward Building 101. (1995)

Site 52 & 55 (Lab Area) – Looking east toward Building 102. (1995)

Site 52 & 55 (Lab Area) – Looking along western side of Building 102 toward Building 102. (1995)

Site 52 & 55 (Lab Area) – Looking west toward Building 102. (1995)

Site 52 & 55 (Lab Area) – Looking north toward Building 102. (1995)

Site 53 (Lab Area) – Looking north from grassy area behind Building 102. (1995)

Site 53 (Lab Area)– Looking north from directly above manhole west of Building 102. (1995)

Site 53 (Lab Area) – Looking north from grassy area behind Building 102. (1995)

Site 53 (Lab Area) – Looking north from directly above manhole southwest of Building 103. (1995)

Site 56 – Looking directly down into pipe outlet manhole adjacent to Building 790. (1995)

Site 56 – Looking directly down into pipe outlet manhole adjacent to Building 790. (1995)

Site 56 – From the northeast end of the site looking southwest toward Building 790. (2005)

Site 56- From the northeast end of the site looking northwest. (2005)

Site 56 – From the northeast end of the site looking west. (2005)

Site 56 – From the northeast end of the site looking northeast. (2005)

Site 56 – From the northeast end of the site looking northeast. (2005)

Site 8 & 56 – Looking west up Lower Stream 56 toward the buried ceramic outlet pipe. (1995)

Site 8 & 56 – Looking north up Lower Stream 8 from stream intersections. (1995)

Site 8 & 56 – Looking east from 56 & 8 stream intersections toward Town Gut area. (1995)

Site 57 – Looking north at manhole and Building 292. (1995)

Site 57 – Looking at the discharge pipe in Building 292. (1995)

Site 57 – Looking north at manhole and Building 292 from asphalt drive. (1995)

Site 57 – Looking east from behind Building 160. (1995)

Site 57 – Looking down into manhole south of Building 292. (1995)

Site 66 – Looking north towards Site 66 and Industrial Wastewater Outfall 21 (IW21) from Olsen Road.

Site 66 – Looking north at Site 66 just north of IW21.

Site 66 –Clinker at Site 66.

Site 66 – Lead flooring at Site 66

Site 66 – View of the stream at Site 66.

Site 66 – Looking towards the northwest at the stream at Site 66.

Site 66 – Looking towards the northwest at the stream at Site 66.

Site 66 – View of an old tire located in the stream along Site 66.

Site 66 – View of the concrete rubble along the stream of Site 66.

Site 66 – From the stream located east of Building 1192, looking west. (2005).

Site 66 – From the stream located east of Building 1192, looking upstream toward the northwest. (2005)

Site 66 – From the stream located east of Building 1192, looking downstream toward the southeast. (2005)

Site 66 – From the stream located east of Building 1192, looking downstream toward the southeast. (2005)

Site 66 – From the stream located east of Building 1192, looking downstream toward the southeast. (2005)

Site 66 – From the stream located southeast of Building 1192, looking downstream toward the southeast. (2005)

Site 66 – From the stream located southeast of Building 1192, looking downstream toward the south. (2005)

Site 66 – From the stream located southeast of Building 1192, and north of Olsen Road, looking downstream toward the south. (2005)

Site 66 – From the stream located southeast of Building 1192 and north of Olsen Road, looking downstream toward the south and Olsen Road. (2005)

UXO 1 – Vegetation surrounding Air Blast Pond. (2003)

UXO 2 – View of pond at Area 8 and the surrounding vegetation. (2003)

UXO 4 – Access road and vegetation across the Basic IED Area. (2003)

UXO 5 – View of north side of advanced IED Area. (2003)

UXO 6 – Looking northwest from the creek bank, near Building 1451. (1995)

UXO 7 – Current conditions at the Old Demolition Range. (2003)

UXO 8 – From northwest corner of the site looking toward the east southeast to Mattawoman Creek. (2005)

UXO 8 – From the northwest corner of the site looking toward the south southeast to Mattawoman Creek. (2005)

UXO 8 – From the south end of the site looking toward the southwest. (2005)

UXO 8 – From the center of the site looking toward the northwest. (2005)

UXO 8 – From the northeast side of the site looking toward the northeast. (2005)

UXO 8 – From the northeast side of the site looking toward the south. (2005)

UXO 8 – From the northwest side of the site looking toward the southwest. (2005)

UXO 8 – From northeastern side of the site looking toward the southeast. (2005)

UXO 8 – From the eastern corner of the site looking toward the west. (2005)

UXO 8 – From near the eastern corner of the site looking toward the east. (2005)

UXO 8 – From near the northwest corner of the site looking toward the southeast. (2005)

UXO 9 – Looking northwest from southern side of Carpenter Road near Building 1685. (1995)

UXO 10 – Vegetation at the Stump Neck Impact Area (looking west from Roach Road). (2003)

UXO 10 – Wetlands at the Stump Neck Impact Area. (2003)

UXO 10 – Heavy shrubs observed from the periphery of the impact area. (2003)

UXO 11 – Looking south from the landing up the grassy hill. (1995)

UXO 11 – Looking southeast from the landing up Torrense Road. (1995)

UXO 12 – Vegetation at the Torpedo Burial Site (looking east down the utility row). (2003)

UXO 12 – Small tributary that bisects the Torpedo Burial site (looking south towards the wetlands. (2003)

UXO 13 – Current conditions of FDR Skeet Range Area. (2003)

UXO 14 – View of Marine Rifle Range looking west toward Building 2195. (2003)

UXO 15 – Current conditions at the Old Skeet and Trap Range. (2003)

UXO 16 – Grass Surrounding the concrete firing pad and bordering hardwood forest. (2003)

UXO 16 – Concrete pad and firing lines visible on the southern tip of the range. (2003)

UXO 17 – Silver contaminated soil. (2004)

UXO 20 – Aerial view of STTP at Main Area.

UXO 20 – Wetland area vegetation on the STTP. (2003)

UXO 21 – Antenna dish partially overgrown by vegetation. (2003)

UXO 21 – Test Area 1 is currently a wooden, overgrown area. (2003)

UXO 22 – Current conditions at Test Area 2 – off-set PVC test ports. (2003)

UXO 23 – The Torpedo Casing Disposal Area and wildlife protection area. (2003)

UXO 25 – Vegetation at the Roach Road Rifle Range. (2004)

UXO 25 – Construction debris identified during the site visit. (2004)

UXO 26 – Shoreline of the Valley Impact Area. (2006)

UXO 26 – Shoreline of the Valley Impact Area. (2006)

UXO 28 – Current site conditions at the EOD School Demolition Area. (2003)

UXO 29 – Current conditions of the Southwest Pistol Range. (2004)

UXO 30 – Current conditions at Gate 3 Burning Ground – wooded area along Potomac River. (2004)

UXO 32 – Looking toward the west at the east end of the Scrap Yard. (2004)

UXO 32 – Looking toward the west along the south side of the Scrap Yard. (2004)

UXO 32 – Looking toward the northeast at the west end of the Scrap Yard. (2004)

UXO 32 – Looking west at the southern side of the Scrap Yard. (2006)

UXO 32 – Looking west at the northern side of the Scrap Yard. (2006)

SWMU 14 – Looking toward the south from 50 feet east of the Building 22SN east corner. (2004)

SWMU 14 – Looking southwest from 50 feet east of the Building 22SN east corner. (2004)

SWMU 14 – Looking toward the southwest from the northwest corner of the trailer. (2004)

SWMU 14 – Looking south from the southeast corner of the trailer. (2004)

SWMU 14-5 – Looking north past the east corner of the Building 2209 to the east corner of Building 22SN. (2004)

SWMU 30 – Looking toward the southwest and Building 2015. (2004)

SWMU 30 – Looking from Building 2015 toward the northeast. (2004)