N00174.AR.000796
NSWC INDIAN HEAD
5090.3a

FINAL ACTION MEMORANDUM SITE 19 CATCH BASINS AT CHIP COLLECTION HOUSES AND SITE 27 THERMAL DESTRUCTOR 1 NSWC INDIAN HEAD MD

01/01/2011

CH2M HILL

Final

Action Memorandum
Site 19 - Catch Basins at Chip Collection Houses and Site 27 – Thermal Destructor I

Naval Support Facility Indian Head
Indian Head, Maryland

Contract Task Order JU35

January 2011

Prepared for

Department of Navy
Naval Facilities Engineering Command
Washington

Under the

LANTDIV CLEAN 1000
Contract N62470-08-D-1000

Prepared by

CH2MHILL

Chantilly, Virginia

Contents

Figures

Acronyms and Abbreviations

ARAR	Applicable or Relevant and Appropriate Requirement
bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
COPC	chemical of potential concern
EE/CA	Engineering Evaluation/Cost Analysis
EPA	U.S. Environmental Protection Agency
ERS	ecological risk screening
FFA	Federal Facilities Agreement
HHRS	human health risk screening
IHIRT	Indian Head Installation Restoration Team
IR	Installation Restoration
mg/kg	milligram(s) per kilogram
MDE	Maryland Department of the Environment
Navy	Department of the Navy
NG	nitroglycerin
NPL	National Priorities List
NSF-IH	Naval Support Facility Indian Head
NTCRA	non-time-critical removal action
RBC	risk based concentration
RSL	regional screening level
SSP	site screening process
TAL	target analyte list
TCL	target compound list
UTL	upper tolerance limit

I. Purpose

The purpose of this action memorandum is to document approval of the proposed non-time critical removal action (NTCRA) being undertaken at Installation Restoration (IR) Site 19 - Catch Basins at Chip Collection Houses (Building 785) and Site 27 – Thermal Destructor I at the Naval Support Facility Indian Head (NSF-IH), in Indian Head, Maryland.

An NTCRA is being conducted by the Department of the Navy (Navy) under the authority of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), the Superfund Amendments and Reauthorization Act of 1986, and applicable provisions of the National Oil and Hazardous Substance Pollution Contingency Plan and the Federal Facility Agreement between the U.S. Environmental Protection Agency (EPA) and the Navy. The NTCRA being implemented at these sites is described in detail in the *Final Engineering Evaluation/Cost Analysis for Sites 19 and 27, Naval Support Facility Indian Head, Indian Head, Maryland* (CH2M HILL, 2010) and is summarized herein. The NTCRA objectives for Sites 19 and 27 are as follows:

- Remove and properly dispose of contaminated soil associated with the sites
- Ensure that soil left in place does not represent an unacceptable risk to human health and the environment
- Ensure that soil left in place does not provide a continuing source of contamination

The Navy has broad authority under CERCLA Section 104 and Executive Order 12580 to carry out removal actions when a hazardous release is on, or the sole source of the release is from, a Navy installation. The Navy IR Program was initiated to identify, assess, characterize, and clean up or control contamination from past hazardous waste disposal operations and hazardous material spills at Navy facilities. This action memorandum follows the guidelines published in the *Department of the Navy Environmental Restoration Program Manual* (Navy, 2006), and *Guidance on Conducting Non-Time Critical Removal Actions under CERCLA* (EPA, 1993). This action memorandum discusses an NTCRA to remove contaminated soil at Site 19 with concentrations above the May 2010 residential soil regional screening levels (RSLs) of 6.1 milligrams per kilogram (mg/kg) for nitroglycerin (NG) and 400 mg/kg for lead; and at Site 27 with concentrations above the 95 percent upper tolerance limit (UTL) background concentrations of 14.9 mg/kg for arsenic and 33.4 mg/kg for chromium.

II. Site Conditions and Background

NSF-IH is located in northwestern Charles County, Maryland, approximately 25 miles southwest of Washington, DC. NSF-IH is a military facility, consisting of the Main Area on the Cornwallis Neck Peninsula and the Annex on Stump Neck. The Main Area is bounded by the Potomac River to the northwest, west, and south; Mattawoman Creek to the south and east; and the town of Indian Head to the northeast. Stump Neck Annex is located across Mattawoman Creek.

NSF-IH was established in 1890 as the Naval Proving Ground, with the mission of testing explosives and propellants. Over its 100-year history of operations, the facility has

manufactured a variety of munitions chemicals. Manufacturing, testing, loading, and assembly operations at the site have generated a variety of explosive, reactive, and hazardous wastes.

In September 1995, NSF-IH was placed on the National Priorities List (NPL). The national Superfund database Comprehensive Environmental Response, Compensation, and Liability Information System identification number for NSF-IH is MD7170024684.

Following NPL listing, negotiations for a Federal Facilities Agreement (FFA) between the Navy and EPA were initiated, and concluded with a signed FFA by all parties in December 2000. As part of the FFA, the Navy formally identified IR Program sites at NSF-IH requiring characterization and remediation as part of CERCLA.

Previous investigations, findings, and recommendations for Sites 19 and 27 are provided in the following reports:

- *Initial Assessment Study* (Fred C. Hart Associates, Inc., 1983)
- *Final Site Screening Process Investigation Report for Sites 19, 26, and 27; Wetland Area Adjacent to Site 45; and Stump Neck SWMUs 14 and 30*, Naval Support Facility Indian Head, Indian Head, Maryland (CH2M HILL, 2009) (herein referred to as Site Screening Process [SSP])
- *Final Engineering Evaluation/Cost Analysis for Sites 19 and 27, Naval Support Facility Indian Head, Indian Head, Maryland* (CH2M HILL, 2010) (herein referred to as engineering estimate/cost analysis [EE/CA])

A. Site Description

1. Removal Site Evaluation

This action memorandum discusses an NTCRA for the removal of NG- and lead-contaminated soil at Site 19 above the RSLs of 7.8 mg/kg and 400 mg/kg, respectively; and the removal of arsenic- and chromium-contaminated soil at Site 27 above the background concentrations of 14.9 mg/kg and 33.4 mg/kg, respectively. An EE/CA was completed, which provides a comparison and evaluation of removal alternatives for this site, and documents the reasons for selecting the recommended alternative. The selected remedy is documented within this action memorandum.

2. Physical Location

Site 19 is located west of Silo Road and consists of drainage areas leading from two chip collection houses, Buildings 785 and 1051. Figure 2 shows the location of Building 785 where the NTCRA will occur. The northern drainage area, leading from Building 785, covers approximately 0.25 acre. The southern drainage area, leading from Building 1051, covers approximately 0.18 acre. Site 27 is located to the east of Benson Road and to the west of Mattawoman Creek and consists of a concrete pad (historically named Building 1584), where the former Thermal Destructor 1 was located, and the immediate surrounding area (Figure 3). The site covers approximately 0.27 acre.

3. Site History and Characteristics

Site 19

Operations at buildings adjacent to Site 19 used a variety of metallic salts in processing explosives. These operations resulted in an aqueous wastewater stream that contained explosives and metallic salts, particularly of copper and lead. Building 785 is still in operation as a chip house, but wastewater is now recycled rather than discharged to the swale. The wooden structure, associated with the northern drainage area catch basin, has been removed; however, the concrete base that supported the wooden catch basin remains in place. Building 1051 is no longer used as a chip collection house and no longer produces a wastewater stream.

Site 27

The thermal destructor was a propane-fired incinerator that burned wastewater between 1976 and 1979. Building 406, adjacent to the concrete pad, was constructed in 1923 and was used as a nitre cake (sodium bisulfate) shed until 1947, when it became a storehouse for acid plant filter materials. From 1957, the building was used as a chemical storehouse until 1976, when it was used for tool and equipment storage.

Since 1999, Building 406 has been used as a heating, ventilating, and air-conditioning storage building. The thermal destructor has been dismantled, and only the concrete pad remains at the site.

4. Release or Threatened Release into the Environment of a Hazardous Substance, or Pollutant or Contaminant

Site 19

Historically, wastewater was drained from Buildings 785 and 1051 through fabric bags to collect the explosive shavings, and then into baffled catch basins to further capture smaller explosive shavings. Spills of explosive shavings may have occurred around and downstream from the catch basins when the fabric bags attached to the outfall end of the pipes ruptured or detached.

Wastewater from Building 785 was historically drained through an 8-inch cast iron pipe into an approximately 2-foot by 2-foot wooden catch basin. Discharge from the catch basin would then lead into a downgradient swale. Discharges from Building 785 occurred from 1956, when the building was constructed, until 1999, when the waste stream was diverted to a wastewater treatment building.

Building 1051 discharged wastewater through an approximately 50-foot-long cast iron pipe, through the fabric bag, to a concrete outfall, and into an approximately 2-foot by 2-foot metal catch basin. Subsequently, water would migrate approximately 15 feet into a downgradient stream before it was diverted to a wastewater treatment building. Discharges from Building 1051 occurred from 1962, when the building was constructed, until 1999, when the waste stream was diverted to the wastewater treatment building.

Site 27

With the exception of the actual incinerator, the entire area was diked during operation of the incinerator. Spills of contaminated wastewater may have occurred in the vicinity of the incinerator when the pump transferring wastewater did not switch off in time. Although no pipe ruptures or leaks were noted in available site records, small releases of contaminated wastewater may have occurred at the location where the inflow piping entered the incinerator.

5. NPL Status

NSF-IH was placed on the NPL on September 29, 1995.

B. Other Actions to Date

1. Previous Actions

An Initial Assessment Study (Fred C. Hart Associates, Inc., 1983) was conducted to identify and assess sites posing a threat to human health or to the environment owing to contamination from past hazardous materials operations at NSF-IH. Sites 19 and 27 were first identified in this study. No sludge deposits were observed in the catch basins, and no evidence of vegetation stress along the swale or stream was noted at Site 19. There was no indication of any spillage or evidence of stressed vegetation in the area surrounding the incinerator at Site 27.

Site 19

A SSP investigation was conducted that included collection of surface soil, subsurface soil, and *in situ* groundwater samples (CH2M HILL, 2009). The samples were analyzed for one or more of the following groups of parameters - target analyte list (TAL) metals, explosives (including NG and nitroguanidine), total organic carbon, and pH. The results indicated that the concentrations of NG and lead in surface soil and subsurface soil, north of Silo Road (Building 785), exceeded the screening criteria. The vertical and lateral extents of NG and lead were delineated for the removal action as described in the EE/CA. The results also indicated no further action was required south of Silo Road (Building 1051).

Site 27

An SSP investigation was conducted that included collection of surface and subsurface soil for unsymmetrical dimethylhydrazine, hydrazine, TAL metals, target compound list (TCL) semi-volatile organic compounds, TCL volatile organic compounds, explosives (including NG and nitroguanidine), total organic carbon, and pH analyses (CH2M HILL, 2009.). The results indicated that the concentrations of arsenic and chromium in surface soil exceeded the screening criteria. The lateral extent of arsenic and chromium was delineated for a removal action as described in the EE/CA.

2. Current Actions

There are no additional actions planned or currently underway at Sites 19 and 27. Only this NTCRA for soil is being proposed for these sites.

C. Role of State and Local Authorities

1. State and Local Actions to Date

Maryland Department of the Environment (MDE) is the state regulatory agency for all IR activities associated with NSF-IH. No local actions have occurred to date.

2. Potential for Continued State/Local Response

MDE, as well as other members of the Indian Head Installation Restoration Team (IHIRT), which includes the EPA, will continue to be consulted until actions addressing the soil at Sites 19 and 27 are complete.

III. Threats to Public Health or Welfare of the Environment and Statutory and Regulatory Authorities

A Human health risk screening (HHRS) and ecological risk screening (ERS) were conducted as part of the SSP investigation to determine if there are chemicals of potential concern (COPCs) that may pose a risk to human health and the environment. A quantitative screening process was performed to identify COPCs. For each site, the maximum concentration for each chemical detected in soil was compared against the 2007 Region III residential soil risk based concentration (RBCs) (from the current table at the time the HHRS was performed). RBCs that were based on noncarcinogenic effects were divided by 10 (to adjust to a Hazard Index of 0.1) to account for the potential exposure to multiple compounds. RBCs associated with carcinogenic effects were based on an excess lifetime cancer risk of 1×10^{-6} and were not adjusted from the values in the RBC table. The residential soil RBCs were used because these values are more conservative than the industrial soil RBCs, and protective of any potential current or future use of the sites (i.e., the residential exposure scenario is the most conservative and would have the highest risk).

If the maximum detected concentration exceeded the screening value, the maximum detected concentrations were compared to site background concentrations. If COPCs were identified based on comparison to site background concentration, then the COPCs were compared against the 95 percent UTL eastern U.S. soils values and Maryland soils values identified the Background Soil Investigation Report tables.

Human health risks were not calculated for the sites; only the potential for unacceptable human health risks above background risk levels were evaluated by comparing the site data to human health screening levels and background concentrations.

Site 19

The HHRS and ERS indicated that NG and lead are COPCs in surface soil/sediment and subsurface soil along the drainage ditch from Building 785 to Silo Road that pose potential risks to human and ecological receptors.

Site 27

The HHRS and ERS indicated that inorganics, mainly arsenic and chromium, in surface soil pose a potential risk to human and ecological receptors.

IV. Endangerment Determination

Actual or threatened releases from Site 19 (NG and lead) and Site 27 (arsenic and chromium) are unlikely to present imminent threats and substantial endangerment to public health, welfare, or the environment under the current land use. The Navy is conducting the removal action at Sites 19 and 27 to remove any potential future threat or endangerment to public health, welfare, or the environment from exposure to soil under unrestricted land use.

V. Proposed Actions and Estimated Costs

A. Proposed Actions

The NTCRA at Sites 19 and 27 will be implemented by the Navy, exercising its removal action authority under CERCLA Section 104 and Executive Order 12580.

1. Proposed Action Description

The delineation of the soil removal areas at Site 19 and 27 were based on the risk screening and background values discussed in Section III. The IHIRT performed a comprehensive evaluation of the sampling data to ensure the sites have been sufficiently characterized and removal areas fully delineated. For Site 19, the NG and lead values used to determine the footprint for soil removal were 7.8 mg/kg and 400 mg/kg, respectively; both values were based on the 2007 residential soil RBCs. In 2009, the RBCs were revised and replaced with RSLs. The footprint for the Site 19 soil removal has been revised to reflect exceedance of the current RSL values of 6.1 mg/kg and 400 mg/kg for NG and lead, respectively; both values are based on the May 2010 residential soil RSLs. For Site 27, arsenic and chromium values used to determine the footprint for soil removal were 14.9 mg/kg and 33.4 mg/kg, respectively; both values are based on the 95 percent UTL background concentrations for arsenic and chromium.

Soil excavation and offsite disposal is recommended at Site 19 for the NG- and lead-contaminated surface and subsurface soil in the drainage area approximately 120 feet east of Building 785 to Silo Road (Figure 2). The total excavation area is approximately 4,810 square feet (0.11 acre). As shown on Figure 2, the excavation area is divided into three subareas based on the different depths of excavation. The upper-excavation subarea is approximately 3,720 square feet to a depth of 0.5 foot below ground surface (bgs); the mid-excavation subarea is approximately 678 square feet to a depth of 2 feet bgs; and the lower-excavation subarea is approximately 414 square feet to a depth of 4 feet bgs. Based on the acreage and varying depths of the total area to be excavated, approximately 216 cubic yards of material will be excavated. Because of limitations posed by the excavation equipment (i.e., minimum bucket width, maneuverability, accuracy, etc.), a 20 percent buffer has been added to the estimate to provide a more-realistic excavation volume.

Soil excavation and offsite disposal is recommended at Site 27 for the arsenic- and chromium-contaminated surface soil around the concrete pad (Figure 3). The total excavation area is approximately 14,695 square feet (0.34 acre) to a depth of 0.5 foot bgs; this corresponds to a total of 299 cubic yards of material to be excavated. This excavation volume includes a 10 percent buffer.

The excavations will be performed by qualified excavation personnel with hazard waste operations and emergency response training. Because of the risk for worker exposure to chemical contamination, air monitoring and/or respirators may be required during excavation activities. The area will be cordoned off during excavation activities to prevent any trespassers from being exposed to contamination until the contaminated soil is removed.

The two removal actions require site preparation, which will consist of clearing trees and brush to provide unobstructed equipment access to the proposed areas for excavation. Overhead steam lines are present at Site 19, which may make accessibility of removal equipment difficult because these features cannot be removed or relocated. Site features, including the roadways, sidewalks, concrete pad, and railroad tracks located within or adjacent to Site 27, will not be removed as part of the excavation. Appropriate erosion control and dust control measures will be installed and maintained in the excavation and staging areas until the excavated area has been re-vegetated or otherwise stabilized.

Because the IHIRT has reached a consensus on the lateral and vertical extents of excavation for the two sites, post-excavation confirmatory sampling will not be necessary. The excavated areas will be backfilled with an approved backfill material that meets specifications for cleanliness and structural stability, depending on the future use of the property. The areas will be graded so that the topography is similar to pre-excavation conditions. The backfill material will be analyzed before placement to ensure its cleanliness and structural suitability for the final slope of the site. After the final grade has been completed, the sites will be re-vegetated using a native grass mix. Straw mulch will be placed over the entire area to minimize erosion of the grass seeds until they germinate.

2. Contribution to Remedial Performance

The NTCRA will eliminate potential risks to human health and the environment from exposure to contaminated soil at both sites.

3. Engineering Evaluation/Cost Analysis

The EE/CA documents the development and evaluation of removal action alternatives and discusses the rationale for the recommended alternative. The EE/CA was submitted to the EPA and MDE in July 2010. The EE/CA was made available to the public and a 30-day public comment period was held from August 18, 2010 to September 18, 2010.

The no-action alternative, evaluated as a point of comparison with the proposed alternative, would not provide an effective solution for the contaminated soil present at Sites 19 and 27. It does not achieve the final remedial action objectives and does not comply with applicable relevant and appropriate requirements (ARARs).

4. Applicable or Relevant and Appropriate Requirements

ARARs were identified for all governmental levels (federal, state, and local). Complete lists of ARARs are presented in Appendix A of the EE/CA.

5. Project Schedule

The removal action contract has not yet been awarded. The tentative removal action is expected to take place in September 2011. The removal action is anticipated to take approximately 2 months to complete, although the actual time to complete these activities may change, depending on weather, site access, and subsurface conditions.

B. Estimated Costs

The cost estimate presented in the EE/CA was developed for comparison with the costs of other alternatives. Actual construction costs may vary from this estimate, based on market conditions, actual material costs, variations in estimated quantities, and other factors existing at the time of construction. The total cost for the Sites 19 and 27 removal action is approximately $210,375, with a potential range between $147,265 and $315,565[1]. This estimate is based on the assumption that soil removal will be performed concurrently at Sites 19 and 27. Refer to Appendix B in the EE/CA for the detailed cost estimate.

No long-term operations, maintenance, or monitoring costs are associated with this action because no waste will be left in place following implementation of the action.

VI. Expected Change in the Situation Should Action be Delayed or not Taken

If no action is taken or the removal action is delayed, the potential for exposure to site contaminants in soil will continue to exist.

VII. Outstanding Policy Issues

There are no outstanding policy issues associated with Sites 19 and 27 at NSF-IH.

VIII. Enforcement

The NTCRA will be performed by the Navy, as the lead agency, exercising its removal action authority under CERCLA, Section 104.

IX. Recommendation and Approval

This decision document represents the selected removal action for Sites 19 and 27 at NSF-IH, developed in accordance with CERCLA as amended, and is consistent with the National Contingency Plan. This decision is based on the administrative record for these sites.

Soil excavation with offsite disposal of contaminated soil has been chosen as the preferred remedy for Sites 19 and 27. Post-excavation sampling will not be conducted at either site. For Site 19, the vertical depths for the three excavated areas will be 0.5 foot bgs, 2 feet bgs and 4 feet bgs, respectively. For Site 27, the vertical depth for the excavated area will be 0.5 foot bgs. The excavated area will be backfilled with clean soil, regraded, and reseeded with native grasses. The excavated soil will be taken to an offsite landfill.

This alternative provides the Navy with a permanent solution that is potentially unhindered by future land use restrictions at the site. It will reduce NG and lead concentrations at

[1] In accordance with EPA guidance, costs are considered to be accurate within -30 percent to +50 percent.

Site 19 and arsenic and chromium concentrations at Site 27 to levels that will eliminate human health and ecological risks and eliminate the potential future concern or pathway for contaminant transport to human and ecological receptors in surrounding and/or downstream areas. This alternative can achieve the remedial action objectives with a great certainty of success, and implementation is technically feasible.

Catherine T. Hanft
Captain, U. S. Navy
Commanding Officer
NSA South Potomac

26 Jan 11
Date

X. References

CH2M HILL, 2009. *Final Site Screening Process Investigation Report for Sites 19, 26, and 27; Wetland Area Adjacent to Site 45; and Stump Neck SWMUs 14 and 30. Naval Support Facility Indian Head. Indian Head, Maryland.*

CH2M HILL, 2010. *Final Engineering Evaluation/Cost Analysis for Sites 19 and 27. Naval Support Facility Indian Head. Indian Head, Maryland.*

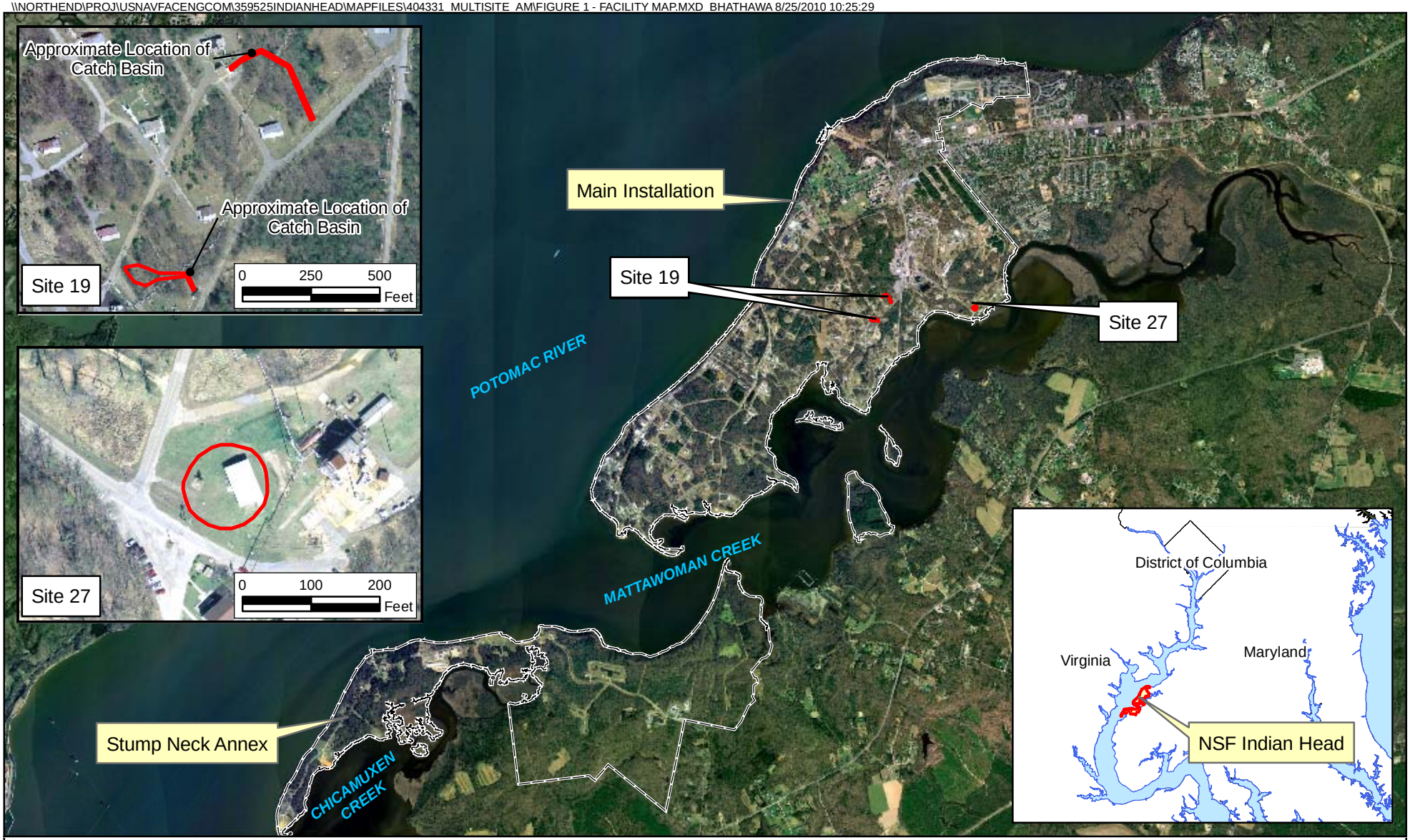
EPA, 1993. Guidance on Conducting Non-Time Critical Removal Actions under CERCLA. OSWER Directive 9360.0-32. EPA/540-R-93-057

Fred C. Hart Associates, Inc. 1983. *Initial Assessment Study of Naval Ordnance Station,* Indian, Head, Maryland.

Navy, 2006. *Department of the Navy Environmental Restoration Program Manual*.

Figures

\\NORTHEND\PROJ\USNAVFACENGCOM\359525INDIANHEAD\MAPFILES\404331_MULTISITE_AM\FIGURE 1 - FACILITY MAP.MXD BHATHAWA 8/25/2010 10:25:29



Legend

IR Site Boundary

Installation Boundary

N
W E
S

0 2,250 4,500 Feet

Figure 1
Facility Map
Action Memorandum for Sites 19 and 27
NSF-IH, Indian Head, Maryland

Imagery Source:Google Earth Pro

CH2MHILL

\\NORTHEND\PROJ\USNAVFACENGCOM\359525INDIANHEAD\MAPFILES\404331_MULTISITE_AM\FIGURE 2 - SITE 19 PROPOSED SOIL REMOVAL AREA.MXD BHATHAWA 8/25/2010 10:30:34

Legend

- Proposed Area for Surface Excavation (3,720.12 sq ft)
- Proposed Area for Subsurface Excavation 2ft bgs (677.45 sq ft)
- Proposed Area for Subsurface Excavation 4 ft bgs (414.37 sq ft)
- Approximate Site Boundary
- Surface Water
- Topographic Contour (5-Foot Interval)

N
W E
S

0 30 60
Feet

Figure 2
Site 19 Proposed Soil Removal Area
Action Memorandum for Sites 19 and 27
NSF-IH, Indian Head, Maryland

CH2MHILL

\\NORTHEND\PROJ\USNAVFACENGCOM\359525INDIANHEAD\MAPFILES\404331_MULTISITE_AM\FIGURE 3 - SITE 27 PROPOSED SOIL REMOVAL AREA.MXD BHATHAWA 8/25/2010 11:09:29

Legend

- Recommended Excavation Area (13,084.22 sq ft)
- Approximate Site Boundary
- Surface Water
- Topographic Contour (5-Foot Interval)
- Topographic Contour (1-Foot Interval)

Excavation will not occur under buildings or include permanent site features (i.e., concrete pad, sidewalks, streets, rail road tracks, etc.).

N
W E
S

0 30 60
Feet

Figure 3
Site 27 Proposed Soil Removal Area
Action Memorandum for Sites 19 and 27
NSF-IH, Indian Head, Maryland

CH2MHILL