Explanation of Significant Difference for the Record of Decision for Soil and Sediment, Area A Downstream Watercourses/Overbank Disposal Area

Naval Submarine Base - New London
Groton, Connecticut

Summary of Explanation of Significant Difference (ESD)

The Navy changed a small portion of the remedy for Operable Unit 3 (OU3) Area A Downstream Watercourses/Overbank Disposal Area. This change was made because some contaminated soil and sediment in and around two abandoned pipes, discovered during excavation, could not be removed without seriously compromising the integrity of the Area A Dike. Instead of removing this soil and sediment, the area around the ends of the pipes was encapsulated with concrete. Institutional Controls, restricting disturbance of the capped area, were instituted in December 2006 with the issuance of the Subase Installation Restoration Instruction 5090.18C, including posting and adding a prohibition on disturbing the area. If the Navy ever disposed the property, deed restrictions would be recorded documenting the restrictions based on applicable State and/or local standards. The rest of the actions of the Record of Decision were implemented including the removal of 18,050 tons of soil and sediment. The altered remedy remains protective of human health and the environment, complies with federal and state requirements, and remains cost-effective.

Introduction

Naval Submarine Base - New London (NSB-NLON) is located in southeastern Connecticut in the towns of Ledyard and Groton. NSB-NLON is situated on the eastern bank of the Thames River, approximately 6 miles north of Long Island Sound. It is bordered on the east by Connecticut Route 12, on the south by Crystal Lake Road, and on the west by the Thames River. The northern border is a low ridge that trends approximately east-southeast from the Thames River to Baldwin Hill. Site 3 is located in the northern end of NSB-NLON, between the Area A dike and the Thames River. OU3 consists of the soil and sediment at Site 3.

In 1990, NSB-NLON was placed on the National Priorities List (NPL). A total of 23 Installation Restoration Program (IRP) sites at NSB-NLON have been or are undergoing investigation and remediation under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The cleanup of these sites is being conducted under the Navy's IRP and meets the requirements of CERCLA, the Superfund Amendments and Reauthorization Act (SARA) of 1986, and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The Navy is the lead agency for performing cleanup with oversight by the United States Environmental Protection Agency (USEPA) Region I and Connecticut Department of Environmental Protection (CTDEP).

In March 1998, the Navy and USEPA, with concurrence from the CTDEP, signed a Record of Decision (ROD) for the soil and sediment associated with the Area A Downstream Watercourses at Site 3 (Navy, 1998).

Statement of Purpose

The selected remedy described in the ROD included excavation and off-site disposal of contaminated soil. A Remedial Design for soil and sediment at Site 3 was completed in 2000 (FWEC, 2000), and excavation, disposal and herbaceous cover were completed in 2000 (FWEC, 2001). However, contaminated soil at one location could not be excavated without

compromising the integrity of the Area A dike; therefore, the area was isolated and encapsulated with concrete rather than excavated. The purpose of this Explanation of Significant Difference (ESD) is to document this difference between the Remedial Action performed and the remedy described in the ROD.

Under a Federal Facilities Agreement entered into between the Navy, EPA, and the State on November 5, 1994, any of the parties may identify a significant change to a selected remedy described in a ROD, after a ROD has been issued. USEPA guidance categorizes post-ROD changes into three categories: (1) *a nonsignificant or minor change*, (2) a *significant change* to a component of the remedy, or (3) a *fundamental change* to the overall remedy. The Navy, as lead agency for NSB-NLON, has determined that a *significant change* to a component of the remedy (encapsulation of a small area rather than excavation) has been made. A significant change involves a change to a component of the remedy that does not fundamentally alter the overall cleanup approach. A significant change to the ROD must be documented in accordance with CERCLA §117(c) and NCP §300.435(c)(2)(i) and §300.825(a)(2). As set forth in NCP §300.435(c)(2)(i), the Navy, as lead agency, must publish an ESD to document this change. The Navy is also required to publish a notice of availability and a brief description of the ESD in a major local newspaper.

In accordance with §300.435(c)(2)(i) and §300.825(a)(2) of the NCP, this ESD will be placed in the Administrative Record File for NSB-NLON and will also be included in the NSB-NLON Information Repositories. The NSB-NLON Information Repositories are located at:

Groton Public Library 52 Newtown Road Groton, CT 06340 (860) 441-6750	Hours: Mon.-Thurs.: 9:00am - 9:00pm Fri.: 9:00am - 5:30pm Sat.: 9:00am - 5:00pm Sun.: Noon - 6:00pm
Bill Library 718 Colonel Ledyard Highway Ledyard, CT 06339 (860) 464-9912	Hours: Mon.-Thurs.: 9:00am - 9:00pm Fri. & Sat.: 9:00am - 5:00pm Sun.: 1:00pm - 5:00pm

Site Description, History, and Contamination

Naval Submarine Base New London

Currently, NSB-NLON consists of over 300 buildings on 687 acres of land. NSB-NLON provides base command for submarine activities in the Atlantic Ocean. It also provides housing for Navy personnel and their families and supports submarine training facilities, military offices, medical facilities, and facilities for submarine maintenance, repair, and overhaul (TtNUS, 2006).

Site 3A - Area A Downstream Watercourses

The Area A Downstream Watercourses receive surface water and groundwater recharge from the Area A Landfill, Area A Wetland, Torpedo Shops, Overbank Disposal Area (OBDA), Overbank Disposal Area Northeast (OBDANE), and surrounding areas and convey them to the Thames River. The Area A Downstream Watercourses include three small ponds (Upper Pond, Lower Pond, and OBDA Pond) and six streams (Streams 1 through 6). The location of this site relative to other IRP sites at NSB-NLON is shown on Figure 1. The general configuration of the Area A Downstream Watercourses and adjacent areas is shown on Figure 2.

The primary water discharge points from the Area A Wetland to the Area A Downstream Watercourses are through four 24-inch-diameter metal culvert pipes located within the dike that separates the Area A Wetland from the Area A Downstream Watercourses. The discharge from these culverts forms a small stream (Stream 4) that flows westward for approximately 200 feet into Upper Pond. Upper Pond discharges to Stream 3, which flows northward and then westward toward Triton Avenue (past the OBDANE site) to the entrance of the Site 7 (Torpedo Shops). At this

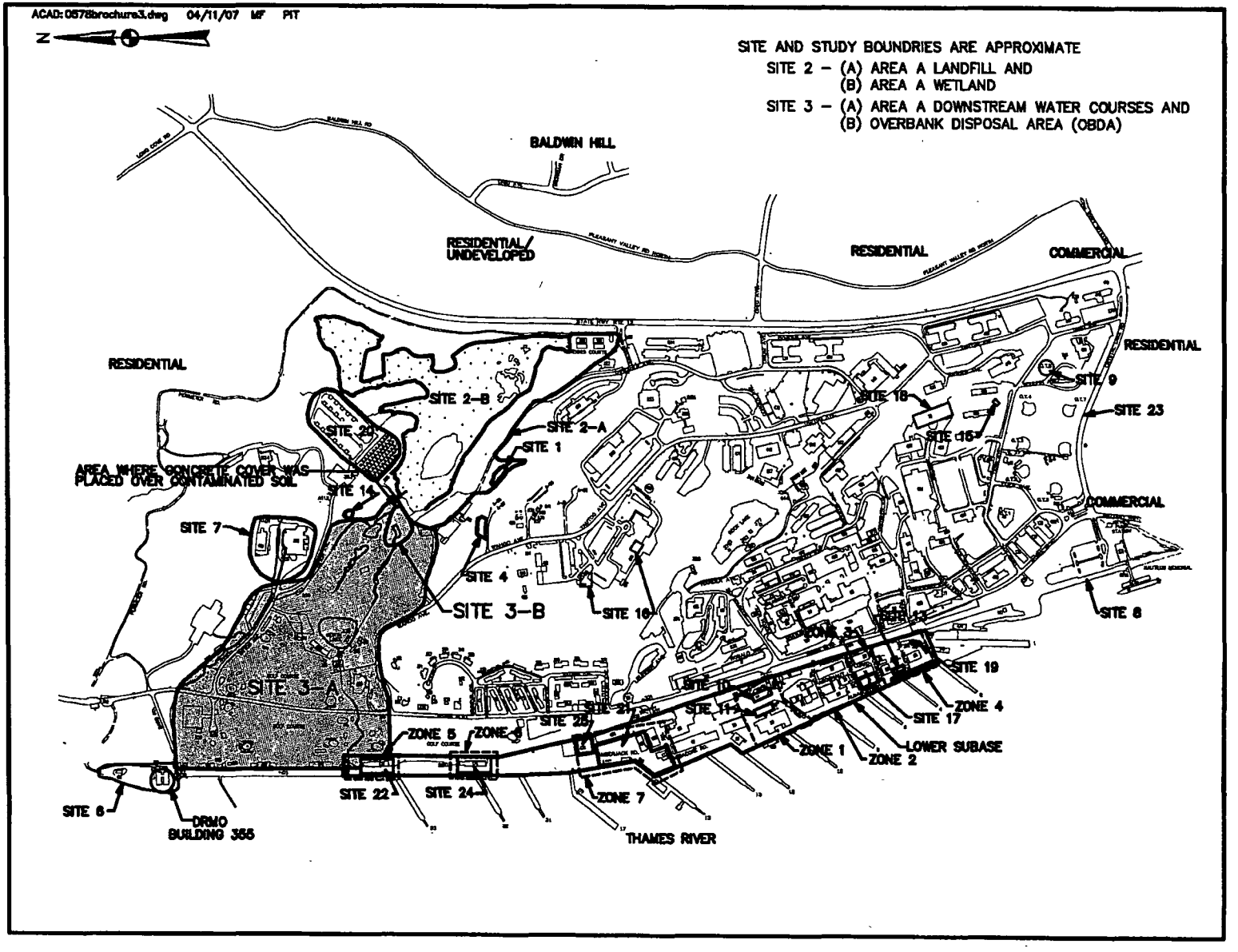
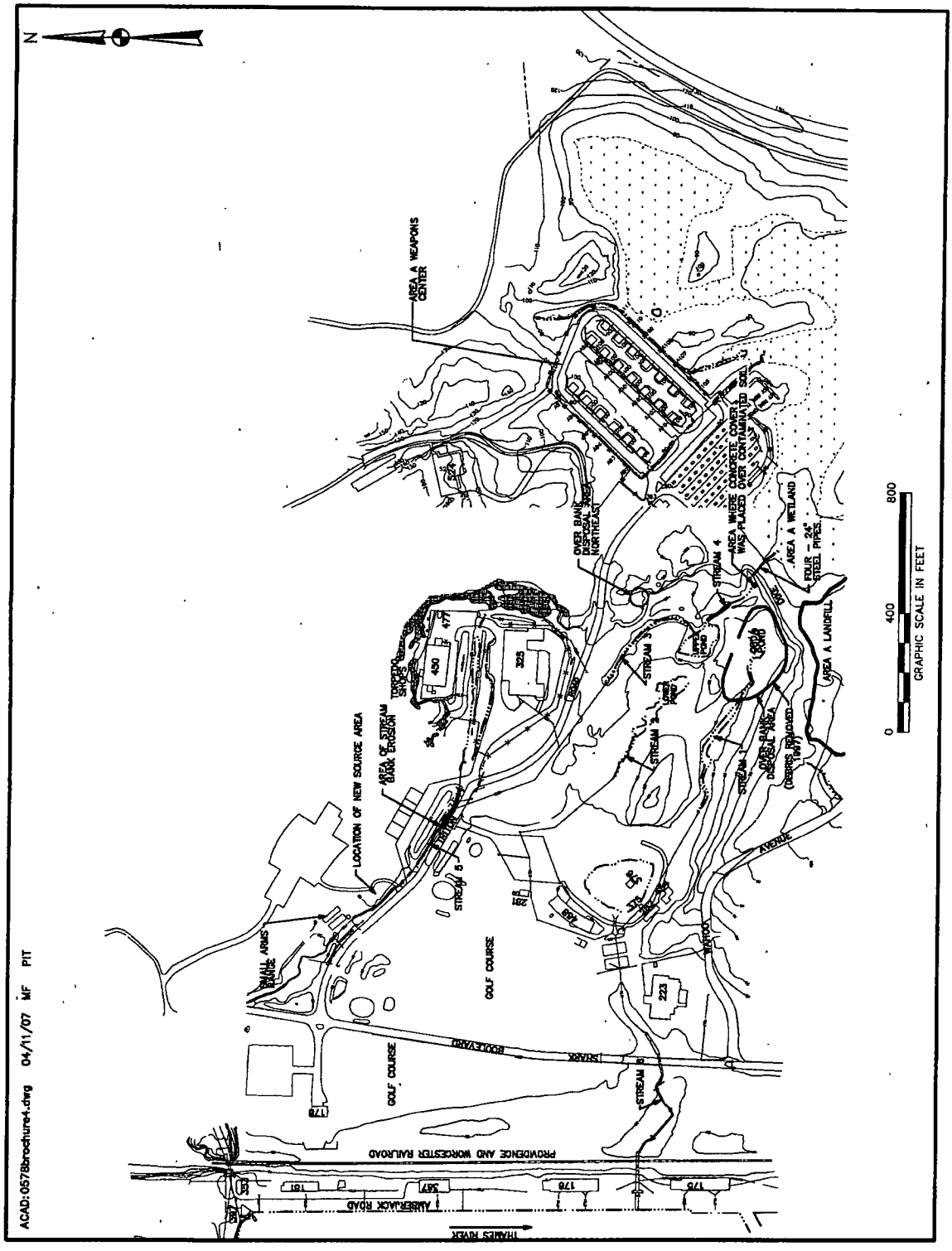


Figure 1: NSB-NLON Site Location Map

Figure 2: Area A Downstream Watercourses



location, it meets the drainage channel from the Torpedo Shops and forms Stream 5. Stream 5 flows westward along Triton Avenue through the Small Arms Range and under Shark Boulevard and eventually discharges to the Thames River at the Site 6 [Defense Reutilization and Marketing Office (DRMO)] outfall.

Most of Site 3 is within designated Explosive Safety Quantity Distance (ESQD) arcs of the Area A Weapons Center; therefore, further development is not planned for this area. Navy regulations prohibit construction of inhabited buildings or structures within these arcs and, although existing buildings operate under a waiver of these regulations, no further construction is planned.

The main cause of contamination at the Area A Downstream Watercourses was the application of pesticides. These pesticides were reportedly applied on the surface of water bodies to control mosquito proliferation at the adjacent base recreational facilities (North Lake and golf course). Additional contaminants are inorganic constituents of river dredge spoil and Area A Landfill material carried over from adjacent sites. Samples of surface soil and sediment showed the presence of mainly 1,1,1-trichloro-2,2-bis(4-chlorphenyl)ethane (DDT), 1,1-dichloro-2,2-bis(4-chlorphenyl)ethane (DDD), 1,1-dichloro-2,2-bis(4-chlorphenyl) ethene (DDE) (collectively referred to as DDTR), and small amounts of other pesticides such as dieldrin. Samples of sediment also contained elevated levels of several metals (such as arsenic, beryllium, cadmium, lead, and zinc) compared to less contaminated reference areas outside the site (B&RE, 1997b).

Site 3B - OBDA

The OBDA was located on the slope of the dike below and adjacent to the Area A Landfill (Site 2). The OBDA was used as a disposal site after the earthen dike was constructed in 1957. All debris from the OBDA area was removed and disposed off site as part of a non-time-critical removal action (NTCRA) in 1997. This removal action was completed during the Area A Landfill Remedial Action because the sites are located adjacent to one another. An Action Memorandum was prepared in 1997 to document the decision process for the NTCRA (Navy, 1997).

Summary of the Navy's Record of Decision and Remedial Action Design

Following a two-phase Remedial Investigation (RI) (Atlantic, 1992 and B&RE, 1997a), remedial alternatives were evaluated as part of a Feasibility Study (FS) for soil and sediment at Site 3 (B&RE, 1997b). The selected remedy was documented in a ROD signed in March 1998 (Navy, 1998). The final remedy for soil and sediment at Area A Downstream/OBDA included the following:

- Removal of surface water followed by treatment and discharge to Thames River.
- Excavation of contaminated soil and sediment followed by on-site dewatering and disposal at an off-site landfill.

The preferred alternative as documented in the ROD included removal, on-site treatment, and discharge of standing water from ponds and streams with appropriate stream flow diversions; placement of clean soil backfill over the excavated soil areas with topsoil cover and revegetation to replace altered wetland functions and values; and placement of suitable borrow material over the dredged sediment areas (such as sand in ponds and gravel in streams) and restoration of aquatic habitats.

The remedial action objectives (RAOs) stated in the ROD are as follows:

- Protection of potential human receptors by preventing incidental ingestion of contaminated soil and sediment containing DDT, DDD, and dieldrin at concentrations exceeding 27 milligram per kilogram (mg/kg), 38 mg/kg and 0.57 mg/kg, respectively.

- Protection of potential human receptors by preventing incidental ingestion of sediment containing arsenic and beryllium at concentrations exceeding 6.1 mg/kg and 2.1 mg/kg, respectively.

- Protection of ecological receptors by preventing contaminated soil (containing DDTR concentrations exceeding 5.6 mg/kg rounded down to 5.0 mg/kg, to be conservative) and contaminated sediment (containing DDTR concentrations exceeding 2.0 mg/kg and dieldrin concentrations exceeding 0.045 mg/kg to 0.195 mg/kg) from entering the food chain.

- Protection of ecological receptors from potential toxicity of sediment containing cadmium, lead, and zinc at concentrations exceeding their respective Effects Range Medium (ER-M) values of 9.6 mg/kg, 218 mg/kg, and 410 mg/kg, respectively.

Based on the RAOs, contaminants of concern (COCs) included various metals and pesticides. Sampling for COCs was required to verify the area and depth of contamination. The Remedial Goals (RGs) for DDTR were 5.0 mg/kg for soil and 2.0 mg/kg for sediment.

Basis for this Explanation of Significant Difference

Approximately 18,050 tons of soil and sediment were excavated and disposed off site during the Remedial Action. Post-excavation confirmatory sampling and analysis were performed to confirm that RGs had been met prior to closing the excavation. Post-construction restoration and long-term monitoring were conducted for 3 years at the site to ensure that vegetation and habitat were properly restored.

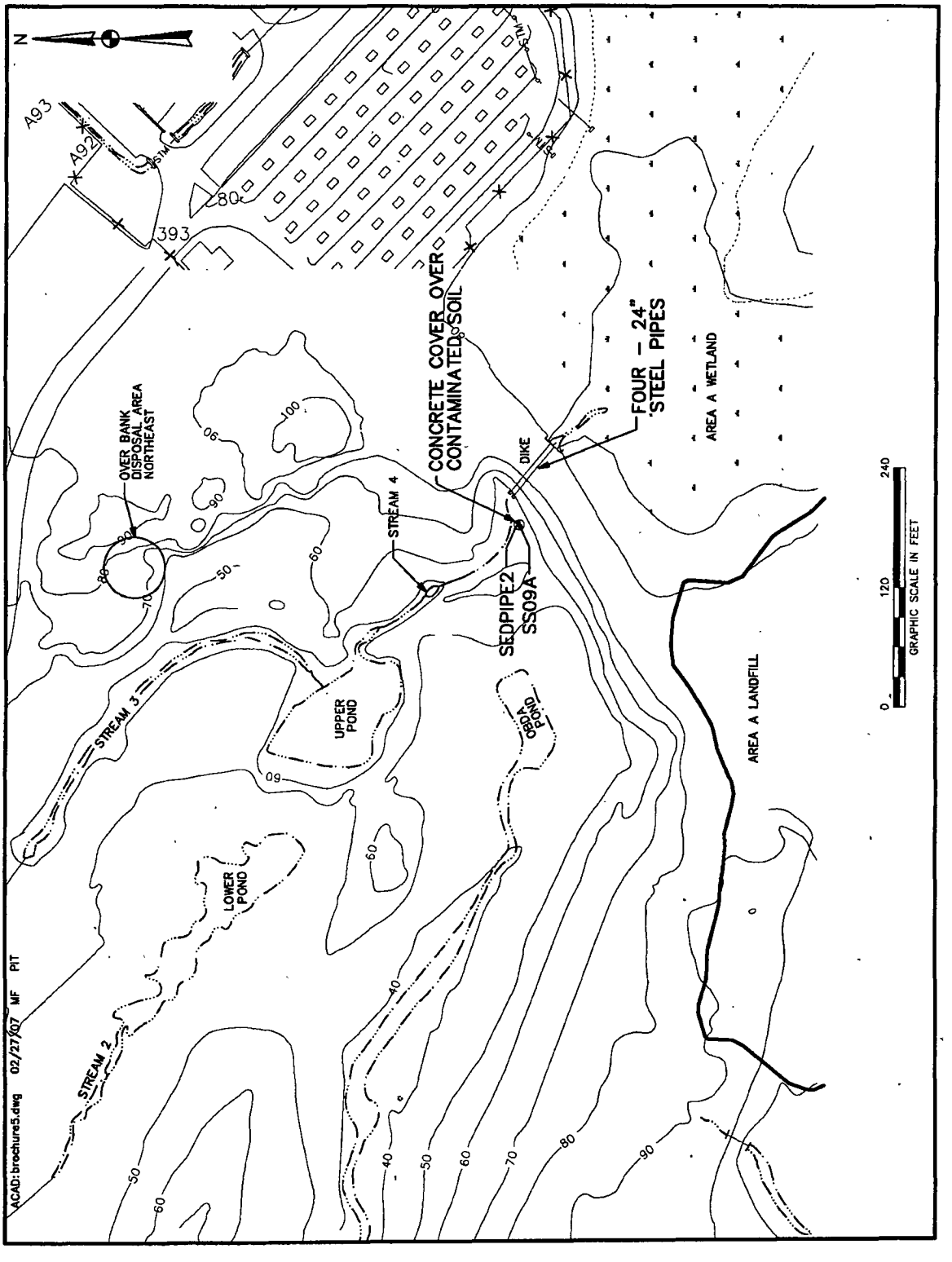
Although the ROD remedy stipulated excavation and off-site disposal of contaminated soil and sediment, contaminated soil and sediment that exceeded RGs were left in place at one location within Site 3. Contaminated soil encompassed and contaminated sediment was contained in two steel pipes found buried in the Area A dike. It was assessed that further excavation at that location would compromise the integrity of the dike, preventing the removal of contaminated soil and sediment. To protect human health and ecological receptors, the soil around the ends of the pipes and the sediment contained within the pipes was encapsulated with concrete.

The sampling and encapsulation of the soil and sediment is documented in *Remedial Action Completion Report, Area A Downstream/OBDA Remediation, Naval Submarine Base New London* by Foster Wheeler Environmental Corporation (FWEC, 2001), including Change Request Form 5. This document is included in the Administrative Record for NSB-NLON.

Description of the Significant Difference

During the remediation of the Area A Downstream Watercourses, post-excavation confirmation samples were collected at the limits of excavation. During the excavation of soil and sediment at the headwaters of Stream 4, two abandoned steel pipes were uncovered at the base of the Area A dike. These abandoned pipes were below and west of the four steel outlet pipes from the Area A Wetland. The abandoned pipes were filled with sediment. The analytical result for a soil sample collected immediately adjacent to the pipes showed a DDTR concentration that exceeded the soil RG of 5 mg/kg. This area was further excavated and resampled. The confirmation sample (Sample SS09A) result of 32.6 mg/kg also exceeded the DDTR remedial goal. Field screening results initially indicated that material inside one of the abandoned pipes exhibited DDTR concentrations greater than the sediment RG of 2 mg/kg. After the outer 5 feet of pipe were removed, analysis of a sample of the remaining material (Sample SEDPIPE2) resulted in a concentration less than the RG for DDTR but the SEDPIPE2 arsenic result of 10 mg/kg slightly exceeded the sediment RG of 6.1 mg/kg. The locations of samples SS09A and SEDPIPE2 are shown on Figure 3. Results of post-excavation analyses indicated that the RGs were met in all watercourses with the exception of these two samples.

Figure 3: Location of Concrete Over Contaminated Soil



When the abandoned pipes were uncovered, it was thought that the pipes conveyed water from Area A during the dredging operation and that they penetrated the entire dike. As documented during remediation in November 1999 in FWEC Change Request Form 5, it was assessed that no further excavation in and around the pipes could occur without seriously compromising the integrity of the Area A dike (FWEC, 2001). To address the problem, the area around the ends of the pipes was isolated and encapsulated using poured concrete on November 18, 1999.

Assuming that the two buried pipes are completely filled with sediment and that the pipes are 18 inches in diameter and 100 feet long, sediment in the pipes can be estimated at 13 cubic yards. Because the ends of the pipes were encapsulated, the material will not be subject to transport by flowing water.

Because DDTR in the soil at Site 3 resulted from surface applications, and DDTR RGs were met at all other post-excavation sample locations, the remaining volume of DDTR-contaminated soil is estimated to be a few cubic yards.

This ESD documents the modification to the ROD that significantly changes, but does not fundamentally alter, the selected remedy. The change to the remedy for Site 3 soil and sediment does not alter excavation and off-site disposal as the general method of remediation. The only significant difference between the remedy selected in the ROD and the Remedial Action occurred at one small location. The outcome of this change has been that some contaminated soil and sediment remains capped in place, in compliance with federal and state standards. These include relevant and appropriated closure and post-closure standards under the federal Resource Conservation and Recovery Act, 42 U.S.C. § 6924 and 40 C.F.R. Part 264 and CT Hazardous Waste Management Regulations, C.G.S. 22a Ch. 445; RCSA 22a-449(c). This soil and sediment has been covered with concrete, which protects human and ecological receptors from accidental contact/ingestion, meets additional ARARs identified under this ESD, and satisfies RAOs. Institutional Controls that restrict disturbance of the capped area were instituted with the Subase Installation Restoration Instruction 5090.18C, including posting and adding a prohibition on disturbing the area. If the Navy ever disposed the property, deed restrictions would be recorded documenting the restrictions based on applicable State and/or local standards. The change requires that institutional controls be implemented and enforced to ensure that the contaminated soil and sediment remains covered and does not present a risk to human health or the environment. The implementation of this change in the remedy had a minimal impact on the total duration and cost of implementing the remedial action for OU3. However, the Navy will need to manage the remaining contaminated soil and sediment through land use controls and will be required to conduct five-year reviews as long as the contaminated soil and sediment continues to present a risk to human health and the environment. This change increased the duration and cost for the final remedy for OU3. The Navy has added the Site 3 soil and sediment into its latest land use control document, Installation Restoration Site Use Restrictions at Naval Submarine Base New London, Groton, Connecticut [SOPA (ADMIN) NLONINST 5090.18C], which was issued in December 2006, and will manage the soils and sediment following these instructions into the future.

Support Agency Comments

USEPA reviewed the ESD and provided comments that the Navy has incorporated into this document. A CTDEP letter of concurrence on the ESD is not required.

Affirmation of the Statutory Determinations

The proposed changes to the selected remedy described in the March 1998 ROD will continue to satisfy all statutory requirements of CERCLA and the NCP. The altered remedy remains protective of human health and the environment, complies with federal and State applicable or relevant and appropriate requirements, and remains cost effective.

Because hazardous substances have been left on site at levels that do not allow for unrestricted use and exposure, CERCLA §121(c) requires that the Navy review the adequacy of the remedy every 5 years. Therefore, OU3 will continue to be included in the NSB-NLON Basewide Five-Year Review.

Public Participation Compliance

As set forth in NCP §300.435(c)(2)(i), the Navy, as lead agency, is required to publish a notice of availability and a brief description of the ESD in a major local newspaper. This notice was published in the New London Day on May 10, 2007. The *Remedial Action Completion Report* (FWEC, 2001), which documents the difference in remediation method from that described in the ROD, was placed in the Administrative Record in 2004. This ESD is available in the NSB-NLON Administrative Record and Information Repositories. In addition, this ESD will be presented at a future Restoration Advisory Board (RAB) meeting.

For More Information

If you have questions about the ESD for the NSB-NLON OU3 ROD, or if you would like further information, please contact:

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TtNUS (Tetra Tech NUS, Inc.), 2006. *Second Five-Year Review Report for CERCLA Sites at Naval Submarine Base New London*, Groton, Connecticut. King of Prussia, Pennsylvania. December.

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DECLARATION

The issuance of this Explanation of Significant Difference for the *Record of Decision for Soil and Sediment, Area A Downstream Water Courses/Overbank Disposal Area, Naval Submarine Base New London, Groton, Connecticut* is concurred with and recommended for immediate implementation:

Department of the Navy

By: _____

Date: 5/10/07

Capt. Mark S. Ginda, USN
Commanding Officer
Naval Submarine Base – New London

United States Environmental Protection Agency

By: _____

Date: 6-5-07

James Owens, Director
Office of Site Remediation and Restoration
USEPA Region I