



Naval Submarine Base New London

SITE 7 - TORPEDO SHOPS and SITE 14 - OVERBANK DISPOSAL
AREA NORTHEAST SOIL - OPERABLE UNIT 8
PROPOSED PLAN

Introduction

In accordance with Section 117 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the law more commonly known as Superfund, this Proposed Plan summarizes the Navy's preferred option for the soil found at the Torpedo Shops (Site 7) and Overbank Disposal Area Northeast (OBDANE) (Site 14), **Operable Unit (OU) 8**, at Naval Submarine Base - New London (NSB-NLON) (Figure 1). The sites are two of 25 sites being addressed by the Navy's **Installation Restoration (IR)** Program at NSB-NLON. The IR Program is being conducted to identify and clean up sites created by past operations that do not meet today's environmental standards.

This Proposed Plan recommends removal of the Site 7 contaminated soil in **OU8**. This proposed action will address both CERCLA risks and State chemical-specific requirements. Detailed descriptions of Site 7 are provided in the **Basewide Groundwater Operable Unit Remedial Investigation (BGOURI) Update/Feasibility Study (FS) Report**, **BGOURI Report**, and Phase II RI Report, which are available in the Information Repositories at the locations identified on Page 10. The **BGOURI Update/FS Report** concluded that there are potential unacceptable risks to human health or the environment from exposure to Site 7 soil and there are potential risks for certain receptors from

The Cleanup Proposal...

After careful study of **OU8**, the Navy proposes the following plan:

Site 7 Soil:

- Complete delineation of contaminated soil and characterization of septic tank contents.
- Excavate, characterize, transport, and dispose contaminated soil and septic tank (if necessary) at an off-site location.
- Collect verification samples to ensure removal of all contaminated soil above remedial goals.
- Restore site to pre-**excavation** conditions.

Site 14 Soil:

- No Further Action.

What Do You Think?

The Navy is accepting public comments on this Proposed Plan from July 16, 2004 to August 17, 2004. You do not have to be a technical expert to comment. If you have a comment or concern, the Navy wants to hear it before making a final decision.

There are two ways to formally register a comment:

1. Offer oral comments during the July 28, 2004 public meeting and hearing, or
2. Send written comments post-marked no later than August 17, 2004 following the instructions provided at the end of this Proposed Plan.

To the extent possible, the Navy will respond to your oral comments during the July 28, 2004 public meeting and hearing. In addition, regulations require the Navy to respond to all formal comments in writing. The Navy will review the transcript of the comments received at the meeting, and all written comments received during the formal comment period, before

making a final decision and providing a written response to the comments in a document called a **Responsiveness Summary**.

Learn More About the Proposed Plan

The Navy will describe the Proposed Plan and hear your questions at an informational public meeting.

A formal public hearing will immediately follow this meeting.

July 28	PUBLIC MEETING
Meeting: 6:30 pm	
Hearing: 7:00 pm	
Date: Wednesday July 28, 2004	
Location: Best Western Olympic Inn, Route 12, Groton, Connecticut	

For further information regarding the public meeting and hearing, call Ms. Melissa Griffin with the NSB-NLON Environmental Department at (860) 694-5191.

Technical terms shown in bold print are defined in the glossary on Page 9.

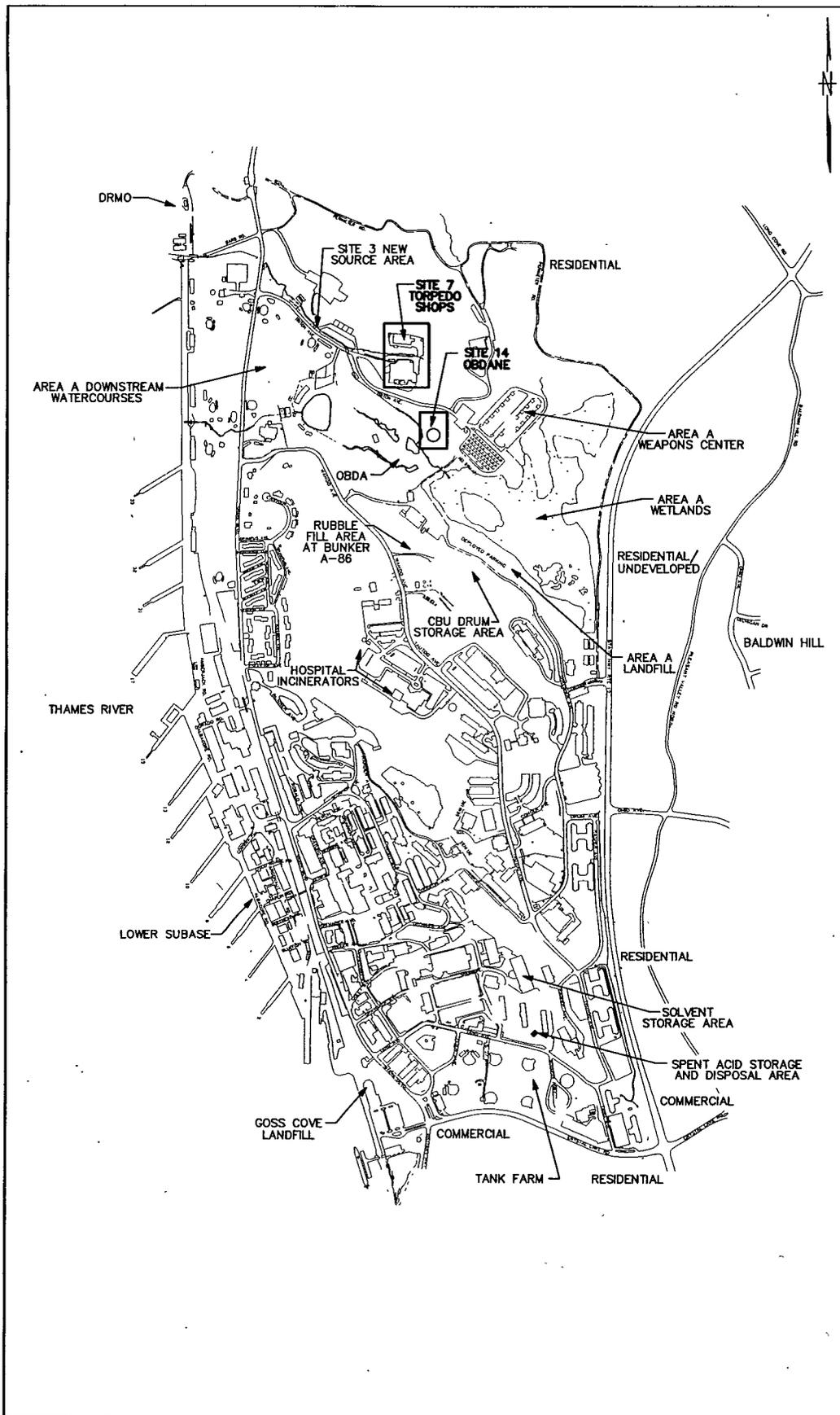


Figure 1. Site Location Map

Introduction (Continued)

direct contact with contaminated soil based on State chemical-specific requirements and potential contaminant migration issues from soil to **groundwater**. The Phase II RI Report concluded that there are no significant risks to ecological receptors from exposure to Site 7 soil. Site 7 **groundwater** contamination is being addressed as part of the Basewide **Groundwater OU9** under a separate action and in a separate decision document.

This Proposed Plan recommends No Further Action for Site 14 soil in **OU8**. A detailed description of Site 14 is provided in the Phase II RI Report, which is available in the Information Repositories. A Non-Time-Critical Removal Action (NTCRA) was conducted at Site 14 in 2001 to remove debris and contaminated soil identified at the site during the Phase II RI. The NTCRA addressed all site-related risks and further action under CERCLA is not necessary. Site 14 **groundwater** is being addressed as part of the Basewide Groundwater **OU9** in a separate decision document.

History

Site 7 is the Torpedo Shops (Buildings 325, 450, 477, and 528) and is located in the northern portion of NSB-NLON on the northern side of Triton Road (Figure 1). The Navy conducts maintenance activities on torpedoes at the site. Contaminated soil at Site 7, **OU8** was found or is suspected on the southern and western sides of Building 325 (Figure 2). The contaminated soil located on the southern side of the building appears to be related to former underground storage tanks used to store fuel oil, and the suspected soil **contamination** on the western side of the building appears to be related to the septic tank for a former septic system. The underground storage tanks were closed in the 1990s, and the septic system was abandoned when sanitary sewers were installed in 1983.

Miscellaneous wastes were dumped at Site 14 in the past. The site is located adjacent to Sites 3 and 7 in a wooded area on the edge of a ravine just north of Stream 3 (Figure 1). An NTCRA was completed at the site in 2001 to address the soil and miscellaneous wastes dumped at the site. Approximately 270 tons of material were removed and disposed off site (see Figure 3), and the site was subsequently restored.

Findings of the Field Investigations

The Navy conducted several field investigations from 1990 through 2000 to assess the nature and extent of **contamination** at Sites 7 and 14. Investigations were performed at **OU8** in 1990, 1994, and 2000. Human health and ecological **risk assessments** were performed to evaluate the potential effects of the **contamination** found in the soil of Sites 7 and 14 on human health and the environment.

The investigation of Site 7 soil identified **polynuclear aromatic hydrocarbons [(PAHs); benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, chrysene, and indeno(1,2,3-cd)pyrene]** and inorganics (metals) as the primary chemicals in the soil at Site 7. The **PAHs** were identified in a small area near the southeastern corner of Building 325 in surface and subsurface soil. The inorganics were detected in soil across Site 7. An additional area of soil **contamination** is suspected near the location of a septic tank formerly used for Site 7 along the western side of Building 325. Benzene, chlorobenzene, and dichlorobenzene were detected in the groundwater originating from the septic tank location. Even though these contaminants were not detected in soil samples collected at nearby locations, it is believed that they are present in the septic tank or surrounding soil and the tank or contaminated soil are acting as the source of these contaminants to groundwater.

The human health **risk assessment** (HHRA) showed that there are no unacceptable risks to potential receptors from direct exposure to the contaminants in Site 7 soil considering EPA's target risk range [1×10^{-4} < incremental cancer risk (ICR) < 10^{-6} ; hazard index (HI) < 1] and CTDEP's acceptable levels for cumulative risk (ICR < 1×10^{-5} ; HI < 1). However, the ICR for full-time workers and child resident from exposure to benzo(a)pyrene in **surface soil** and **surface/subsurface soil**, respectively, exceeded CTDEP's target level for individual chemicals (1×10^{-6}). In addition, there were contaminants detected at concentrations that exceeded Connecticut's Remediation Standard Regulations (RSRs), which are **applicable or relevant and appropriate requirements (ARARs)** for **OU8**. The maximum concentration of benzo(a)pyrene in soil exceeds Connecticut's RSRs Industrial/Commercial Direct Exposure soil criterion and the maximum concentrations of benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and indeno(1,2,3-cd)pyrene in soil exceed Connecticut's RSRs Residential Direct Exposure soil criteria. The maximum concentrations of

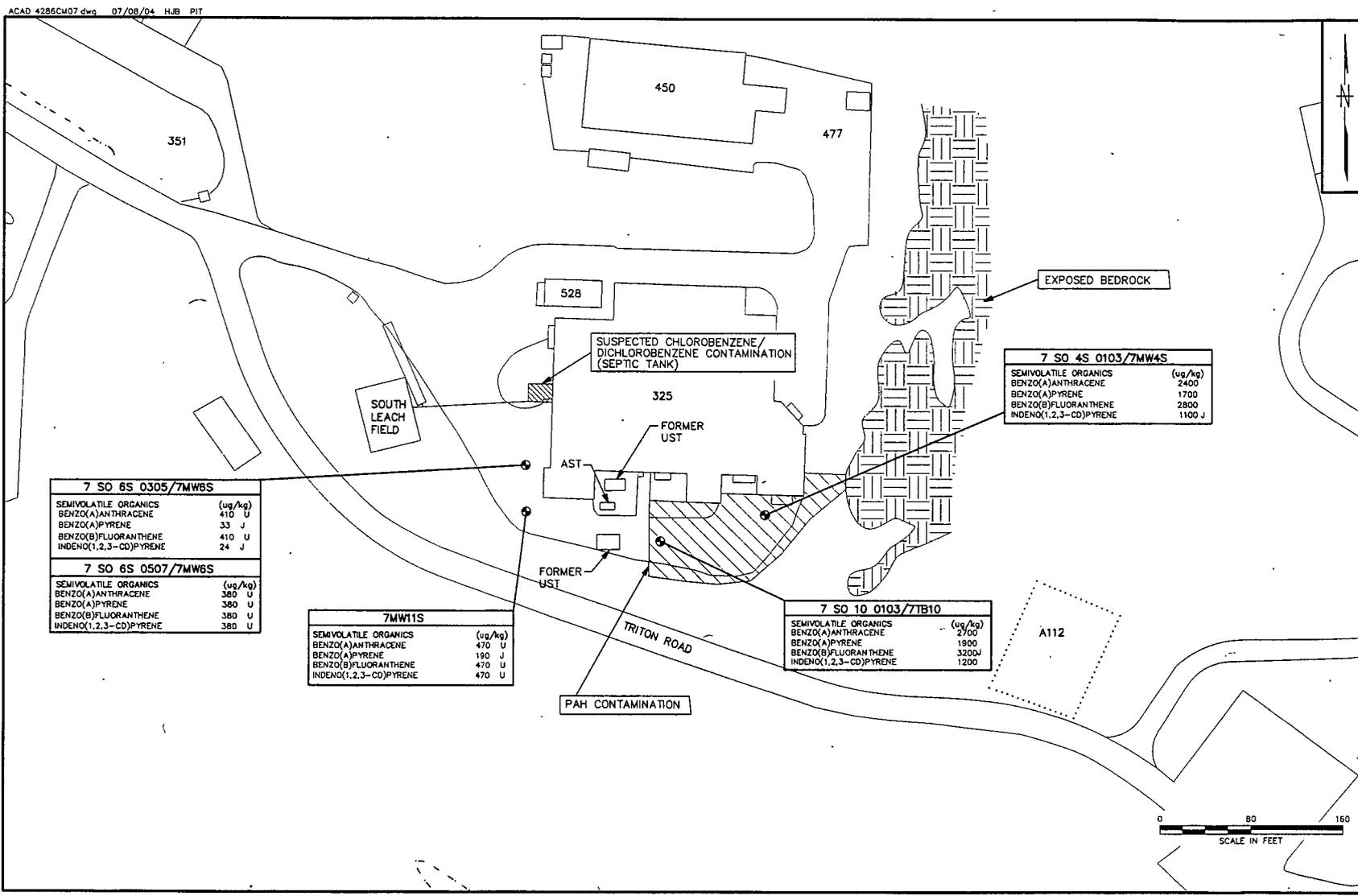


Figure 2. Site 7 Layout and Contaminant Distribution Map

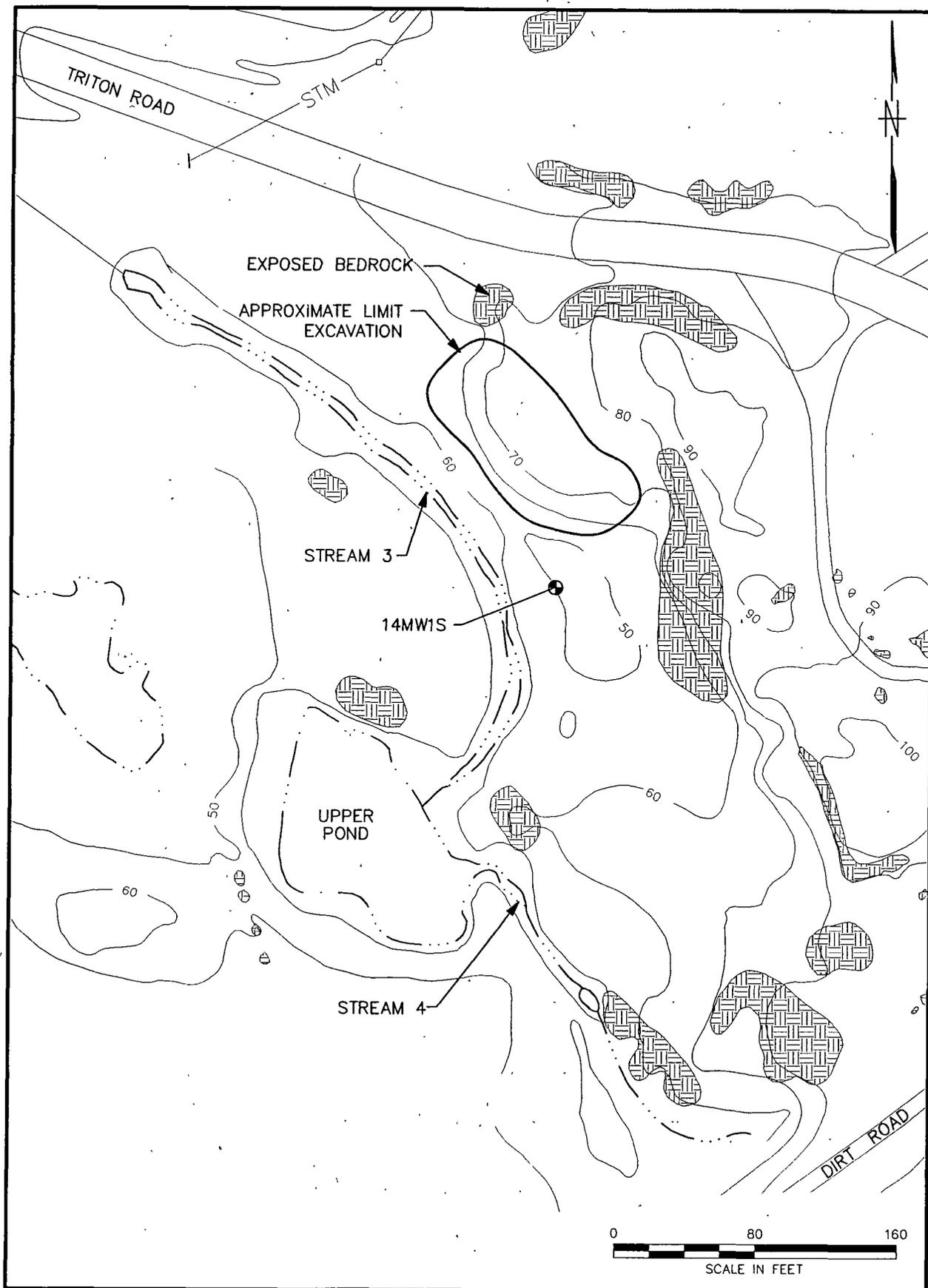


Figure 3. Site 14 NTCRA Limit of Excavation

benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, chrysene, and indeno(1,2,3-cd)pyrene also exceed Connecticut's RSRs Pollutant Mobility Criteria, indicating a potential soil to **groundwater** contaminant migration concern; however, the available site data indicates that the potential for soil to **groundwater** migration of PAHs is not significant.

In addition, the HHRA showed that there are potential unacceptable risks to future adult residents from exposure to maximum concentrations of benzene, chlorobenzene, and dichlorobenzene in Site 7 **groundwater** along the western side along Building 325 [Site 7 **groundwater** is addressed in the **Record of Decision (ROD)** for Sites 3, 7, 14, 15, 18, and 20 **Groundwater** (a portion of the Basewide **Groundwater OU9**)]. Because it is suspected that the source of these **groundwater** contaminants is the septic tank or surrounding soil, these three **groundwater** contaminants were retained as suspected soil contaminants of concern (COCs) without performing additional sampling activities. The Navy took this approach to expedite resolution of Site 7 soil, and additional sampling activities will be performed as part of a pre-design investigation to confirm the extent of soil contamination at Site 7 and the contents of the septic tank.

An assessment of the risks to ecological receptors from exposure to surface soil at Site 7 was conducted during the Phase II RI. It was concluded that the Torpedo Shops soil represents little potential risk to ecological receptors. No ecological COCs were retained for the site and subsequently no response action is required for ecological receptors.

The Site 7 COCs and the remedial goals selected for each of them are as follows:

COCs	Remedial Goals that are Protective of Future Receptors
Benzene	0.02 milligrams/kilograms (mg/kg)
Chlorobenzene	2.0 mg/kg
1,4-Dichlorobenzene	1.5 mg/kg
Benzo(a)anthracene	1.0 mg/kg
Benzo(a)pyrene	1.0 mg/kg
Benzo(b)fluoranthene	1.0 mg/kg
Indeno(1,2,3-cd)pyrene	1.0 mg/kg

It is the Navy's current judgement that the Preferred Alternative identified in this Proposed Plan, or one of the other active measures considered in the Proposed Plan, is necessary to protect public health or welfare or the environment from actual or threatened releases of pollutants or

What is Risk and How is it Calculated?

A human health **risk assessment** estimates "baseline risk." This is an estimate of the likelihood of health problems occurring if no cleanup action were taken at a site. To estimate baseline risk at a site, the Navy undertakes a four-step process:

- Step 1: Analyze Contamination
- Step 2: Estimate Exposure
- Step 3: Assess Potential Health Dangers
- Step 4: Characterize Site Risk

In Step 1, the Navy looks at the concentration of contaminants found at a site as well as past scientific studies on the effects these contaminants have had on people (or animals, when human studies are unavailable). Comparisons between site-specific concentrations and concentrations reported in past studies helps the Navy to determine which contaminants are most likely to pose the greatest threat to human health.

In Step 2, the Navy considers the different ways that people might be exposed to the contaminants identified in Step 1, the concentrations that people might be exposed to, and the potential frequency and duration of exposure. Using this information, the Navy calculates a "reasonable maximum exposure" (RME) scenario, which portrays the highest level of human exposure that could reasonably be expected to occur.

In Step 3, the Navy uses the information from Step 2 combined with information on the toxicity of each chemical to assess potential health risks. The likelihood of any kind of cancer resulting from a site is generally expressed as an upper bound probability; for example, a "1 in 10,000 chance." In other words, for every 10,000 people that could be exposed, one extra cancer may occur as a result of exposure to site contaminants. An extra cancer case means that one more person could get cancer than would normally be expected to from all other causes. For non-cancer health effects, the Navy calculated a "hazard index." The key concept here is that a "threshold level" (measured usually as a hazard index of less than 1) exists below which non-cancer health effects are no longer predicted.

In Step 4, the Navy determines whether site risks are great enough to cause health problems for people at or near the site. The results of the three previous steps are combined, evaluated, and summarized. The Navy adds up the potential risks from the individual contaminants to determine the total risk resulting from the site.

contaminants from Site 7 soil which may present an imminent and substantial endangerment to public health or welfare.

The investigation of Site 14 soil identified minimal organic contamination, including low concentrations of volatile organic compounds, **PAHs**, and pesticides, and slightly more significant inorganic contamination (e.g., arsenic and lead). The HHRA showed that the risks to potential receptors associated with Site 14 soil were minimal; however, the results of the ecological risk assessment indicated that the chemicals detected in Site 14 soil could adversely impact ecological receptors. A NTCRA was conducted at Site 14 in 2001 and approximately 270 tons of debris and contaminated soil were removed and disposed off site. The remedial goals selected for the NTCRA were a combination of the goals selected for the Area A Downstream Watercourses/OBDA (Site 3/**OU3**) remedial action and the Connecticut GB Pollutant Mobility Criteria. By removing all debris and contaminated soil with concentrations above the remedial goals, the Navy addressed all site-related risks. It is the Navy's current judgment that No Further Action under CERCLA is necessary for Site 14 soil.

Summary of Alternatives Considered for OU8

The Navy prepared the **BGOURI Update/FS** to evaluate alternatives for Site 7, **OU8**. The three alternatives evaluated included Alternative S1 (No Action), Alternative S2 (Institutional Controls with Permeable Cover), and Alternative S3 (**Excavation** and Off-Site Disposal). Alternative S1 was evaluated for comparison purposes, and the other two alternatives were selected based upon their abilities to meet the Remedial Action Objectives (RAOs). The RAOs as defined in the **FS** are (1) to protect current receptors (construction workers and employees) from incidental exposure to contaminated soil, (2) to protect existing **groundwater** quality, (3) to protect aquatic ecological receptors, and (4) to protect potential future receptors (residential use) from incidental exposure to contaminated soil. The following table summarizes the remedial alternatives considered in the **FS**. Estimated costs are presented, including capital, operation and maintenance (O&M), and total present worth costs.

Alternatives Evaluation Criteria

The following is a summary of the nine Superfund-mandated criteria used to balance the pros and cons of the remedial alternatives. The **FS** alternatives were evaluated using the first seven criteria. After comments from the

Remedial Alternatives	Components	Comments
<p>Alternative S1:</p> <p>No Action</p>	<p>None, except mandatory five-year site reviews.</p>	<p>This alternative is not expected to be fully protective of human health and the environment.</p> <p>Capital Cost = \$0 O&M Cost (Present Worth) = \$89,600 Total Present Worth Cost = \$89,600</p>
<p>Alternative S2:</p> <p>Institutional Controls With Permeable Cover</p>	<p>Place restrictions on excavation and handling of impacted soils as well as future development of the site. Testing would be required for disposal of impacted soil.</p> <p>Maintain existing permeable cover (soil/gravel/asphalt) over contaminated soil. The permeable cover would be maintained as required by Connecticut regulations.</p> <p>Groundwater monitoring for potentially mobile contaminants present in Site 7 soil would be conducted as part of the Basewide groundwater remedy.</p> <p>Conduct five-year site reviews.</p>	<p>Under this alternative human health and the environment would be protected through institutional controls and a permeable cover that restrict excavation and exposure to Site 7 impacted soil. However, this alternative does not address the possibility of soil contamination migrating to the groundwater where it could cause potential human health or ecological impacts.</p> <p>Capital Cost = \$6,250 O&M Cost (Present Worth) = \$91,750 Total Present Worth Cost = \$98,000</p>
<p>Alternative S3:</p> <p>Excavation and Off-Site Disposal</p>	<p>Delineation of contaminated soil and characterize the septic tank contents.</p> <p>Excavate, characterize, transport, and dispose/recycle all contaminated soil to residential reuse standards and septic tank (if necessary) offsite.</p> <p>Conduct verification sampling.</p> <p>Perform site restoration.</p>	<p>Under this alternative human health and the environment would be protected since the contaminated soil and septic tank would be removed from the site and disposed properly.</p> <p>Capital Cost = \$440,200 O&M Cost = \$0 Total Present Worth Cost = \$440,200</p>

State of Connecticut and public are received, the alternatives will be compared using the last two criteria to select the final remedy for Site 7, **OU8**.

1. **Overall protection of human health and the environment:** The alternative should protect human health as well as plant and animal life on and near the site.
2. **Compliance with Applicable or Relevant and Appropriate Requirements (ARARs):** The alternative should meet applicable and relevant and appropriate federal and State environmental statutes, regulations, and requirements.
3. **Long-term effectiveness and permanence:** The alternative should maintain reliable protection of human health and the environment over time.
4. **Reduction of toxicity, mobility, or volume through treatment:** CERCLA contains the statutory preference that the selected alternative should use treatment to permanently reduce the level of toxicity of contaminants at the site, the spread of contaminants away from the **source of contamination**, or the amount of **contamination** at the site.
5. **Short-term effectiveness:** The alternative should minimize short-term hazards to workers, residents, or the environment during implementation of the remedy.
6. **Implementability:** The alternative should be technically feasible, and the materials and services needed to implement the remedy should be readily available.
7. **Cost:** Capital costs, annual operation and maintenance costs, and their associated net present values of all alternatives retained for detailed analysis shall be compared.
8. **State acceptance:** The State environmental agencies should agree with the proposed remedy.
9. **Community acceptance:** The community should agree with the proposed remedy. Community acceptance is based on comments received during the public meeting and public comment period.

The Navy's Proposed Remedy

The Navy's proposed remedy for Site 7 soil is Remedial Alternative S3. Alternative S3 meets all of the RAOs by

removing the contaminated soil from the site to meet residential reuse standards. This remedial alternative consists of four major components; (1) Finalize delineation of soil **contamination** and characterize the contents of the septic tank, (2) Excavate, characterize, transport, and dispose contaminated soil and septic tank (if necessary), (3) Collect verification samples to ensure removal of all contaminated soil, and (4) Restore site. This alternative can be completed within 1.5 years after the start of design activities.

To finalize delineation of soil **contamination** and verify the contents of the septic tank, additional soil borings (approximately 15) will be advanced and soil/waste samples (approximately 30) will be collected to determine the horizontal and vertical extent of contaminated soil and the nature of the contents of the septic tank. A sampling plan will be developed to provide the details of the pre-design sampling program.

Following delineation, **excavation** equipment will be used to excavate the contaminated soil from **OU8** (approximately 1,600 cubic yards of **PAH**-contaminated soil and 90 cubic yards of benzene-, chlorobenzene-, and dichlorobenzene-contaminated soil) and the septic tank, if necessary. Approximately 200 cubic yards of clean soil will also need to be excavated to ensure stable sidewalls of the **excavation**. The excavated soil will be temporarily stockpiled and characterized to determine the appropriate disposal facility. Upon determination of the appropriate disposal facility, the contaminated soil and the septic tank, if necessary, will be loaded into trucks and transported to the off-site disposal facility.

After the **excavation** of contaminated soil and the septic tank, if necessary, soil samples will be collected from the bottom and sidewalls of each **excavation** area and analyzed to verify the removal of the COCs or to verify that COCs remaining at the site are at concentrations less than the remedial goals.

Lastly, after the contaminated soil and the septic tank, if necessary, have been excavated and removed from **OU8**, clean soil will be brought to the site to backfill the **excavations**. Following the backfilling of the **excavations**, the surface will be returned to pre-**excavation** conditions (grassed, paved, or gravel).

The U.S. Environmental Protection Agency (EPA) and Connecticut Department of Environmental Protection (CTDEP) concur with the Navy's Proposed Remedy. Based on information currently available, the Navy believes the Preferred Alternative meets the threshold criteria and pro-

vides the best balance of tradeoffs among the other alternatives with respect to balancing and modifying criteria. The Navy expects the Preferred Alternative to satisfy the following statutory requirements of CERCLA §121(b): a. be protective of human health and the environment; b. comply with **ARARs**; c. be cost-effective; d. utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and e. satisfy the preference for treatment as a principal element, or explain why the preference for treatment will not be met.

The Navy also recommends No Further Action for the Site 14 soil in **OU8**. By removing all debris and contaminated soil with concentrations above the remedial goals during the NTCRA, the Navy addressed all site-related risks.

Glossary of Technical Terms

Applicable or Relevant and Appropriate Requirements (ARARs): The federal and state environmental rules, regulations, and criteria that must be met by the selected remedy under Superfund.

Basewide Groundwater Operable Unit Remedial Investigation (BGOURI) Update/Feasibility Study (FS): A Remedial Investigation report describes the site, documents the nature and extent of **contaminants** detected at the site, and presents the results of the risk assessment. An **FS** report presents the development, analysis, and comparison of remedial alternatives.

Contamination: Any physical, biological, or radiological substance or matter that, at a certain concentration, could have an adverse effect on human health and the environment.

Excavation: Earth removal with construction equipment such as backhoe, trencher, front-end loader, excavator, etc.

Feasibility Study (FS): A report that presents the development, analysis, and comparison of remedial alternatives.

Groundwater: Water found beneath the earth's surface. **Groundwater** may transport substances that have percolated downward from the ground surface as it flows towards its point of discharge.

Installation Restoration (IR) Program: The purpose of the program is to identify, investigate, assess, characterize, and clean up or control releases of hazardous sub-

stances; and to reduce the risk to human health and the environment from past waste disposal operations and hazardous material spills at Navy activities in a cost-effective manner.

milligrams per kilogram (mg/kg): One part of contaminant in a million parts of a solid material.

Operable Unit (OU): Operable units are site management tools that define discrete steps towards comprehensive actions as part of a Superfund site cleanup. They can be based on geologic portions of a site, specific site problems, initial phases of action, or any set of actions performed over time or concurrently at different parts of the site.

Polynuclear Aromatic Hydrocarbons (PAHs): High molecular weight, relatively immobile, and moderately toxic solid organic chemicals featuring multiple benzenic (aromatic) rings in their chemical formula. Typical examples of **PAHs** are benzo(a)anthracene and benzo(a)pyrene.

Record of Decision (ROD): An official document that describes the selected Superfund remedy for a site. The **ROD** documents the remedy selection process and is issued by the Navy and EPA following the public comment period.

Remedial Investigation (RI): A report which describes the site, documents the nature and extent of contaminants detected at the site, and presents the results of the **risk assessment**.

Responsiveness Summary: A summary of written and oral comments received during the public comment period, together with the Navy's and EPA's responses to these comments.

Risk Assessment: Evaluation and estimation of the current and future potential for adverse human health or environmental effects from exposure to contaminants.

Sediment: Soil, sand, and minerals typically transported by erosion from soil to the bottom of surface water bodies such as streams, rivers, ponds, and lakes.

Source: Area(s) of a site where **contamination** originates.

Surface soil: Soil, sand, and minerals typically found within the top 12-inches of the earth's surface.

Subsurface soil: Soil, sand, and minerals typically found deeper than the top 12-inches of the earth's surface.

The Public's Role in Alternative Selection

Community input is integral to the selection process. The Navy and regulatory agencies will consider all comments in selecting the remedial action prior to signing the **ROD**. The public is encouraged to participate in the decision-making process.

This Proposed Plan for **OU8** is available for review, along with supplemental documentation, at the following Information Repositories:

Groton Public Library Hours:
52 Newtown Road Mon. - Thru.: 9:00am - 9:00pm
Groton, CT 06340 Fri.: 9:00am - 5:30pm
(860) 441-6750 Sat.: 9:00am - 5:00pm
Sun.: noon - 6:00pm

Bill Library Hours:
718 Colonel Ledyard Mon. - Thru.: 9:00am - 9:00pm
Highway Fri. & Sat.: 9:00am - 5:00pm
Ledyard, CT 06339 Sun.: 1:00pm - 5:00pm
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