Naval Submarine Base - New London

SITE 3 - NEW SOURCE AREA SOIL
PROPOSED PLAN

Introduction

This Proposed Plan summarizes the Navy's preferred option to remediate the soil in the **New Source Area (NSA)** at Site 3 (Area A Downstream Watercourses) at Naval Submarine Base - New London (NSB-NLON) (Figure 1). Only the soil at the Site 3 - **NSA**, which is a small portion of Site 3, is addressed in this Proposed Plan; groundwater issues at Site 3 will be addressed separately under the **Record of Decision (ROD)** prepared for the groundwater at Sites 3, 7, 14, 15, 18, and 20 which are a portion of the Basewide Groundwater **Operable Unit (OU)** 9. The Site 3 - **NSA** was identified, but not addressed, during the remedial action that took place for the Site 3 soil and sediment **(OU3)**. Site 3 - **NSA** is located within the limits of Site 3, but it is being addressed independently from **OU3** at Site 3. The Site 3 - **NSA** was not addressed during the remedial action when it was discovered because the nature and extent of contamination was unknown. Site 3 is one of 25 sites being addressed by the Navy's **Installation Restoration (IR) Program**. The **IR Program** is being conducted to identify and clean up sites created by past operations that do not meet today's environmental standards.

A detailed description of Site 3 is provided in the **Basewide Groundwater Operable Unit Remedial Investigation (BGOURI) Update/Feasibility Study (FS)** Report, which is available in the Information Repositories at the locations identified on Page 7. Petroleum contamination was the only chemical of concern (COC) identified for the Site 3 - **NSA** soil. Because petroleum is excluded from consideration under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (the law more commonly known as Superfund), the **FS** for Site 3 - **NSA** soil was prepared to meet the requirements of the Navy's **IR Program** and the State of **Connecticut Remediation Standard Regulations (RSRs)**.

This Proposed Plan recommends remedial action for Site 3 - **NSA** soil. The **BGOURI Update/FS** Report did not identify unacceptable human health risk and petroleum contamination is excluded from consideration under CERCLA; therefore, the Proposed Remedy under CERCLA is No Further Action (NFA). However, because petroleum concentrations at the site

The Cleanup Proposal...

After careful study of Site 3 - **NSA** soil the Navy proposes the following plan:

Under CERCLA
◊ NFA

Under State Regulations
◊ Finalize delineation of petroleum-contaminated soil.
◊ Construct a temporary detour road to maintain access to critical Navy facilities.
◊ Excavate, characterize, transport and dispose/recycle all petroleum-contaminated soil off site as appropriate.
◊ Collect verification samples to ensure removal of all petroleum-contaminated soil.
◊ Restore site to pre-**excavation** conditions.

Technical terms shown in bold print are defined in the glossary on Page 8.

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, or

2. Send written comments postmarked 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: July 28, 2004
Location: Best Western Olympic Inn, Route 12, Groton, Connecticut

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

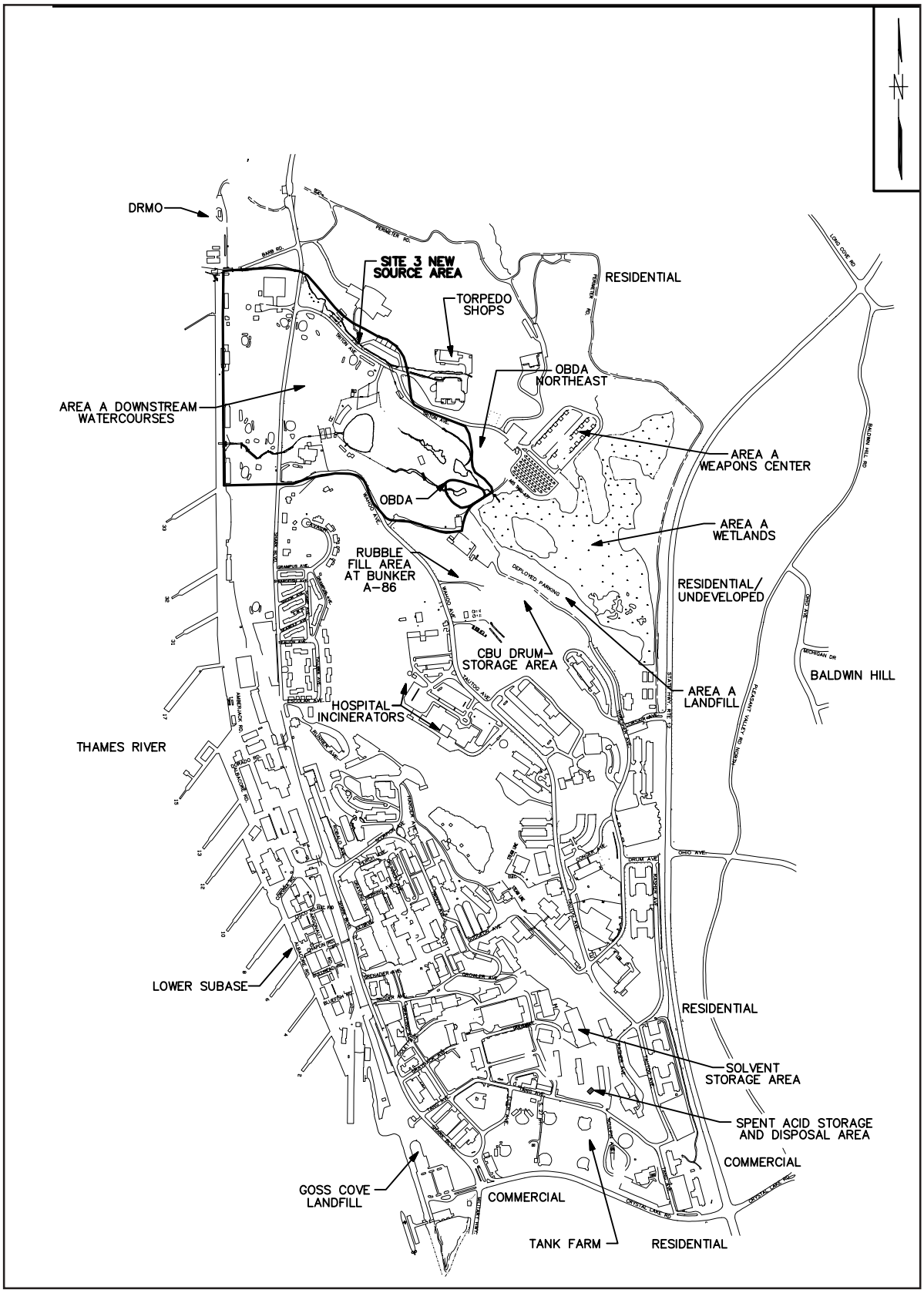

Figure 1. Site Location Map

Introduction (Continued)

exceed the **Connecticut RSRs**, remediation will occur to address State regulations. Remedial action is recommended to protect people from direct exposure to contaminated soil. Also, there is potential for free petroleum product to migrate from soil to groundwater and from groundwater to surface water. Due to these potential risks, remedial action is proposed.

History

Site 3 is located in the northern portion of NSB-NLON and includes undeveloped wooded areas and recreational areas (golf course and lake for swimming). Site 3 - **NSA** (0.06 acre) and the Area A Downstream Watercourses/Over Bank Disposal Area (OBDA) (9 acres) are the only portions of Site 3 (approximately 75 acres) where soil issues were identified. Groundwater issues have been identified in most of Site 3 and they are being addressed in a separate **ROD**. As shown on Figure 2, the Site 3 watercourses include North Lake and several small ponds and interconnected streams. The streams within Site 3 convey surface water to the Thames River. Site 3 was investigated in several phases from 1990 to 2002. In March 1997, accumulated debris in the OBDA (Figure 2), including discarded wooden pallets, telephone poles, and empty tanks, was removed as part of a Time-Critical Removal Action and disposed off site. During 1999 and 2000, a **remedial action (RA)** was initiated for Site 3 **OU3** and the removal of contaminated soil and sediment was completed. Approximately 18,050 tons of soil and sediment contaminated with pesticides and metals were excavated and disposed at off-site disposal facilities. Site restoration activities are still ongoing.

Site 3 - **NSA** is a small abandoned disposal area (0.06 acre) located along the northern edge of Site 3, just north of Triton Road and Stream 5 (Figure 3). Site 3 - **NSA** was discovered during the **RA** for Site 3 **OU3**. Sediment that exhibited potential petroleum contamination (i.e., odor and sheen on pooled water) was encountered during the **RA** activities. Upon further investigation, a small disposal area was discovered on the hillside adjacent to Stream 5. Debris such as rusted drums and wire cable was found intermingled with soil and boulders. The **NSA** was not remediated at the time of the Site 3 **OU3 RA** because the nature and extent of contamination was unknown, but temporary measures were taken to minimize any further contaminant migration. Groundwater at Site 3 was further investigated during the **BGOURI** in 2000, but the results of the investigation were inconclusive and data gaps remained. To address the newly found Site 3 - **NSA** and the data gaps identified during the **BGOURI**, a **Data Gap Investigation (DGI)** was completed in the fall of 2002 prior to initiating a **FS**. During the **DGI**, temporary wells were installed to measure groundwater levels and sample groundwater, and soil samples were also collected. The samples were analyzed for **contaminants** including metals, organics, pesticides, and polychlorinated biphenyls (PCBs). The results of the **DGI** were presented and evaluated in the **BGOURI Update/FS,** and remedial alternatives were developed to address the contaminated soil associated with Site 3 - **NSA**.

Findings of the Field Investigations

During the 1999-2000 **RA** for **OU3**, a sample of the sediment that exhibited potential petroleum contamination was col-

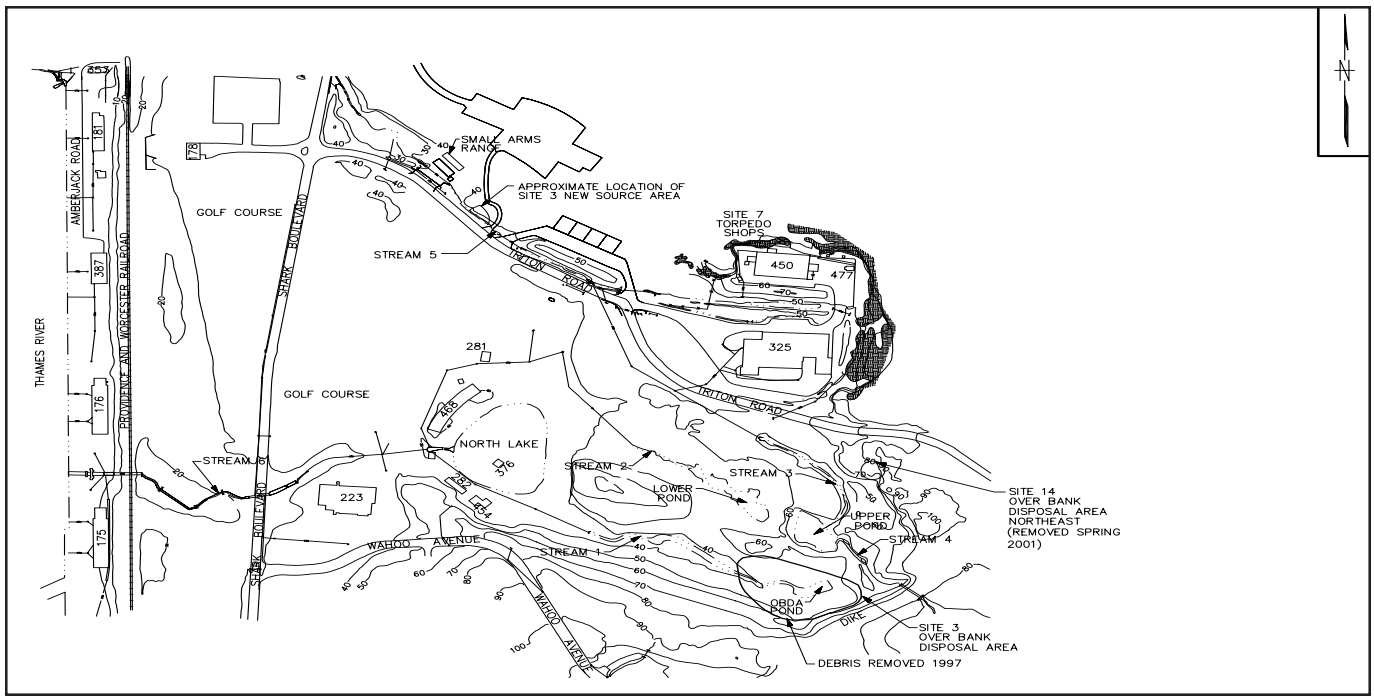

Figure 2. Site 3 Layout Map

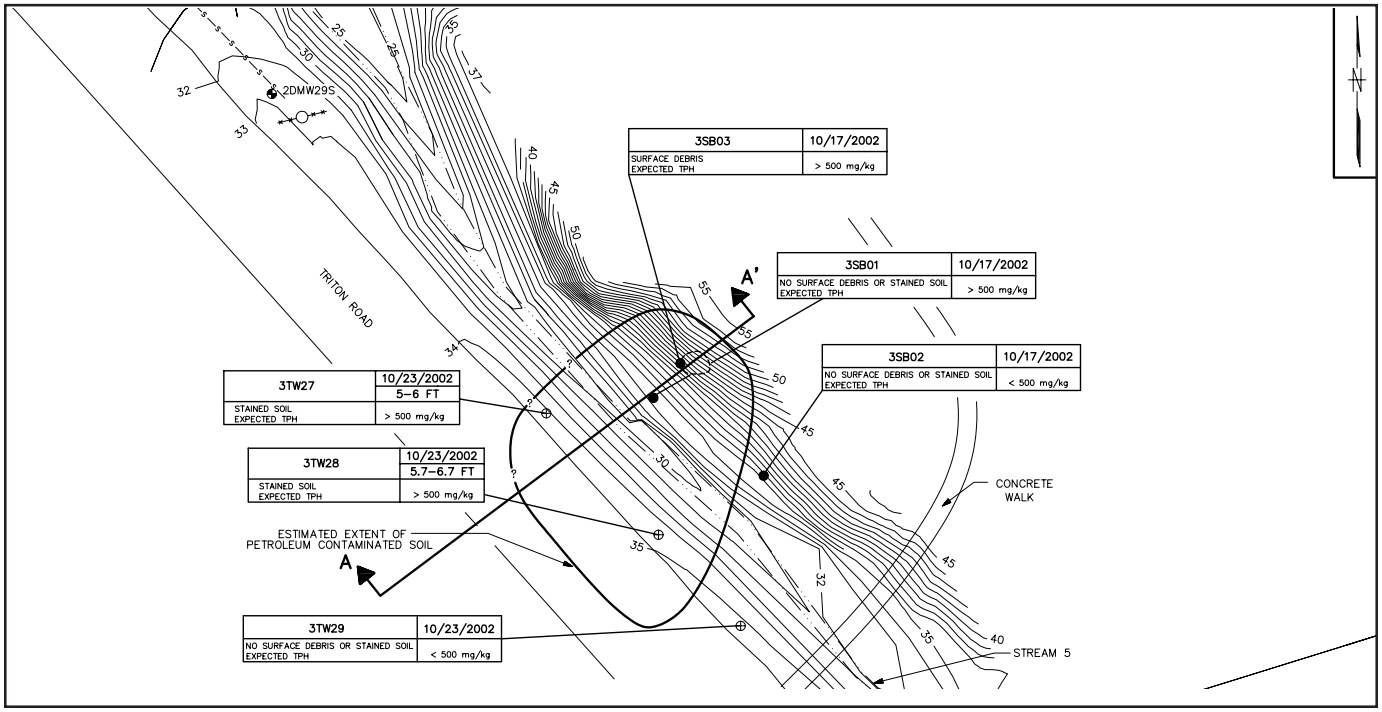

Figure 3. Site 3 - New Source Area Layout and Contaminant Distribution Map

lected and analyzed. **Total Petroleum Hydrocarbons (TPH)** were detected at a concentration of 1,750 **milligrams per kilogram** (**mg/kg)** in the sediment sample. **TPH** at this concentration exceeds the direct exposure and pollutant mobility criteria for soil pursuant to the State's **RSRs**. During the **DGI**, petroleum-stained subsurface soil was found in two soil borings, and field-screening vapor measurements indicated the presence of petroleum. The results of the **DGI** showed that petroleum and **polynuclear aromatic hydrocarbons (PAHs)** were the primary **contaminants** in the soil at the Site 3 – **NSA**. However, the **PAH** contamination was localized and found to be related to the Triton Road asphalt pavement. The **PAHs** were not retained as COCs because they were not site-related. The petroleum contamination detected during the **DGI** appears to be from a historic release at Site 3 - **NSA**. The petroleum contamination was present at the interface where overlying soil meets bedrock and has migrated to the south beneath Stream 5 and potentially beneath Triton Road (Figure 4).

The results of the **human health risk assessment (HHRA)** conducted during the **BGOURI** Update for **contaminants** other than **TPH**, such as metals and organic compounds, indicated that there were no unacceptable risks to human health or the environment. In addition, a screening level **ecological risk assessment (ERA)** was conducted for Site 3 - **NSA contaminants** other than **TPH**, and it showed that there are no significant risks to ecological receptors from direct exposure to soil or potential exposure from migration of soil contamination to sediment or groundwater to surface water at the Site 3 - **NSA**. Based on these results, petroleum was the only contaminant retained as a COC for Site 3 - **NSA**. The

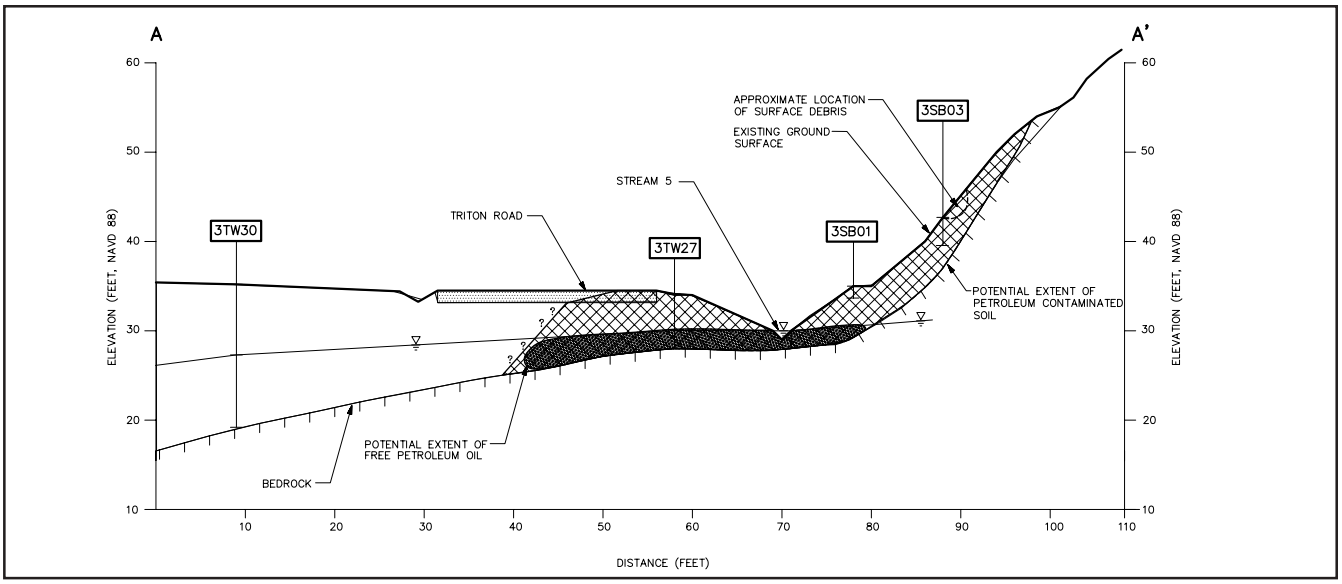

Figure 4. Cross Section A-A' through Site 3 - New Source Area

remedial goals (RGs) selected for petroleum for protection of human health and the environment are provided below. These **RGs** address the direct exposure and pollutant mobility criteria for soil pursuant to the State's **RSRs**.

Receptor	Remedial Goal
Human (Future Potential Resident)	500 **mg/kg** [**Extractable TPH (ETPH)**]
Ecological	No mobile free product

It is the Navy's current judgement that the Preferred Alternative identified in the 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 contaminants from Site 3 - **NSA** soil which may present an imminent and substantial endangerment to public health or welfare.

Summary of Alternatives Considered for Site 3 - NSA Soil

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

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.

Remedial Alternatives	Components	Comment
Alternative S1: No Action	None.	This alternative is not expected to be fully protective of human health and the environment because of risks from non-CERCLA regulated contaminants. Capital Cost = $0 O&M Cost (Present Worth) = $0 Total Present Worth Cost = $0
Alternative S2: Institutional Controls	Place restrictions on **excavation** and handling of impacted soil as well as future development of the site. Maintain existing permeable cover (soil/gravel/asphalt) over contaminated soil. Monitor for the migration of petroleum.	Under this alternative human health and the environment would be protected through institutional controls that restrict **excavation** and exposure to impacted soil. Monitoring would be used to track any migration of petroleum from site soil. Capital Cost = $61,100 O&M Cost (Present Worth) = $63,100 Total Present Worth Cost = $124,200
Alternative S3: Excavation and Off-site Disposal	Finalize delineation of petroleum-contaminated soil. Construct temporary road. Excavate, characterize, transport, and dispose/recycle all contaminated soil off site. Conduct verification sampling. Perform site restoration.	Under this alternative human health and the environment would be protected since all of the contaminated soil would be removed from the site and disposed properly. Capital Cost = $286,100 O&M Cost = $0 Total Present Worth Cost = $286,100

Alternatives Evaluation Criteria

The following is a summary of the nine criteria recommended for use under the Navy's **IR Program** to balance the pros and cons of the remedial alternatives. The Navy and State of Connecticut agreed that the use of these criteria and the FS evaluation approach meets the intent of the Connecticut **RSRs**. The **FS** alternatives were evaluated using the first seven criteria and the State of Connecticut has agreed to the proposed remedial action. After comments from the public are received, the alternatives will be further compared using the public's input to verify that the selected alternative is the most appropriate for Site 3 - **NSA**.

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 Statutory and Regulatory Requirements**: The alternative should meet applicable 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**: As a preference, 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 agency should agree with the proposed remedy.

9. **Community acceptance**: The community should agree with the proposed remedy. Community acceptance is based on the comments received during the public meeting and public comment period.

The Navy's Proposed Remedy

The Navy's Proposed Remedy for Site 3 - **NSA** soil under CERCLA is NFA.

The Navy's Proposed Remedy is cleanup under State of Connecticut authority of non-CERCLA regulated soil contamination that poses a risk. To meet State requirements the Navy selected Remedial Alternative S3: **Excavation** and Off-Site Disposal. The alternative meets all of the RAOs by removing the contaminated soil from the site. This remedial alternative consists of five major components: (1) Finalize delineation of petroleum-contaminated soil; (2) Construct a temporary detour road to maintain access to critical Navy facilities; (3) Excavate**,** characterize, transport, and dispose/recycle all petroleum-contaminated soil; (4) Collect verification samples to ensure removal of all petroleum-contaminated soil; and (5) Restore site. This alternative can be completed within 1.5 years after the start of design activities.

- Finalizing the delineation of petroleum-contaminated soil will involve advancing soil borings and collecting soil samples to determine the horizontal and vertical extent of the contaminated soil.

- A temporary detour road will be installed south of Triton Road to maintain vehicular access to various critical Navy facilities during the **excavation** of contaminated soil beneath Triton Road.

- Petroleum-contaminated soil will be excavated and stockpiled at the site. **Excavation** will continue until verification samples indicate that all petroleum-contaminated soil with **ETPH** concentrations greater than 500 mg/kg (**RG**) has been removed. The estimated volume of petroleum-contaminated soil is 385 cubic yards (580 tons). Approximately 136 pounds (18 gallons) of petroleum may be present in the contaminated soil. The estimated volume of additional overlying clean soil and uncontaminated rock expected to be mixed with the contaminated soil is 129 cubic yards (190 tons). It is also estimated that an additional 127 cubic yards (190 tons) of material will need to be excavated to ensure a stable **excavation**.

- The stockpiled contaminated soil will subsequently be sampled and characterized and then disposed or recycled offsite as appropriate.

- Rocks (boulders) that can be easily separated from contaminated soil will be set aside, cleaned if necessary, and subsequently placed back into the **excavation** after **excavation** activities are complete. Also, clean soil may be excavated to gain access to the contaminated soil and to form stable side walls. This clean soil will be segregated, tested, and used during site restoration. Onsite and imported clean soil will be used to restore the site and reinstall Triton Road.

- The temporary detour road will be removed after excavation activities are complete and Triton Road is reinstalled. Material from the temporary detour road will be re-used as fill material as appropriate.

The U.S. Environmental Protection Agency (EPA) and Connecticut Department of Environmental Protection (CTDEP) concur with the Navy's Proposed Remedy of NFA under CERCLA. The CTDEP concurs with the Navy's Proposed Remedy of **Excavation** and Off-Site Disposal under the Connecticut **RSRs**.

Based on information currently available, the Navy believes the Proposed Remedy of **Excavation** and Off-Site Disposal meets the CTDEP **RSRs** and provides the best balance of tradeoffs among the other alternatives. The Navy expects the Proposed Remedy of **Excavation** and Off-Site Disposal to satisfy the following minimum requirements: a. be protective of human health and the environment; b. comply with statutory and regulatory requirements; c. be cost-effective; and d. utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable.

The Public's Role in Alternative Selection

Community input is integral to the selection process. The Navy, EPA, and State of Connecticut will consider all comments in selecting the remedial action prior to signing the **Record of Decision**. The public is encouraged to participate in the decision-making process.

This Proposed Plan for Site 3 - **NSA** soil is available for review, along with supplemental documentation, at the following Information Repositories:

Groton Public Library 52 Newtown Road Groton, CT 06340 (860) 441-6750	Hours: Mon. - Thur.: 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. - Thur.: 9:00am - 9:00pm Fri. & Sat.: 9:00am - 5:00pm Sun.: 1:00pm - 5:00pm

For further information, please contact:

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Glossary of Technical Terms

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.

Connecticut Remediation Standard Regulations (RSRs): Connecticut regulations (Sections 22a-133k-1 through 3 of the Regulations of Connecticut State Agencies) concerning the remediation of polluted soil and groundwater.

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

Data Gap Investigation (DGI): A follow-up investigation performed to address data gaps identified in the results of the previous investigation.

Ecological Risk Assessment (ERA): Scientific method to evaluate the effects on ecological receptors to exposure to **contaminants** in site-specific medium (e.g., soil, groundwater, etc.)

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

Extractable Total Petroleum Hydrocarbons (ETPH): A method of analysis designed to measure certain widely used petroleum products such as kerosene, jet and diesel fuels, No. 2 to No. 6 fuel oils, and motor oil. The **ETPH** method may be used for testing soil and groundwater samples and is used specifically to demonstrate compliance with Connecticut **RSRs**.

Human Health Risk Assessment (HHRA): Scientific method to evaluate the effects on human receptors to exposure to **contaminants** in site-specific medium.

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

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

New Source Area (NSA): The newly identified disposal area within Site 3 where petroleum contamination was discovered.

Operable Unit (OU): Contaminated media, site, or set of sites that are evaluated as a group.

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 naphthalene and phenanthrene.

Record of Decision (ROD): An official document that describes the selected CERCLA remedy for a site.

Remedial Action (RA): Activities to control exposure to, treat, or remove contaminated medium, waste, or material.

Remedial Goal (RG): Allowable concentration of contaminant that can be left in medium and not adversely impact human health or the environment. It may also be the end result of a long-term action that stops or substantially reduces a release or threatened release of hazardous substances.

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

Total Petroleum Hydrocarbons (TPH): Measure of the concentration or mass of organic compounds containing carbon and hydrogen in petroleum and derived products.

USE THIS SPACE TO WRITE YOUR COMMENTS

Your input on the Proposed Plan for Site 3 - **NSA** soil at Naval Submarine Base – New London is important to the Navy. Comments provided by the public are valuable in helping the Navy select the final clean-up remedy for this site.

You may use the space below to write your comments, then fold and mail. Comments must be postmarked by August 17, 2004. Comments can be submitted via mail or e-mail and should be sent to either of the following addresses:

Mr. Mark Evans, Remedial Project Manager
Naval Facilities Engineering Command
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10 Industrial Highway
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Ms. Melissa Griffin
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Building 439
Groton, CT 06349-5039
Tel: (860) 694-5191
e-mail: griffinm@cnrne.navy.mil

If you have any questions about the comment period, please contact Mr. Mark Evans at (610) 595-0567 ext. 162.

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Name _____

Address _____

City _____

State _____ Zip _____

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