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PUBLIC NOTICE REGARDING PROPOSED PLAN FOR SOUTHERN AREA GROUNDWATER  
PLUME NWIRP CALVERTON NY  
10/01/2011  
NAVFAC MIDLANT



# PROPOSED PLAN

## Southern Area Groundwater Plume

Naval Weapons Industrial Reserve Plant Calverton  
Calverton, New York

### 1 INTRODUCTION

This **Proposed Plan** identifies the preferred remedial alternative and explains the rationale for the Navy's preference for mitigating threats from chlorinated and non-chlorinated **volatile organic compounds (VOCs)** in **groundwater** posed to human health and the environment at the Southern Area at Naval Weapons Industrial Reserve Plant (NWIRP) Calverton, Calverton, New York (Figures 1 and 2). In addition, this Proposed Plan also describes other remedial alternatives evaluated for this site. The preferred alternative consists of **Land Use Controls (LUCs)** to prevent human exposure to VOC-contaminated groundwater; extraction, treatment, and discharge of groundwater at the Fence Line Area to reduce or eliminate offsite migration of **contaminants**; and **monitoring** to determine if additional action is required to optimize operation of the Fence Line Area Treatment System and protect ecological receptors. If additional treatment is required, it would consist of **Anaerobic Biodegradation** and/or **Air Sparging**. See Section 9 for more detail.

The Navy is the lead federal agency under the **National Oil and Hazardous Substances Pollution Contingency Plan (NCP)**, 40 CFR Part 300, and Executive Order 12580, as amended by Executive Order 13016, for **Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)** response activities at Calverton and under the **Defense Environmental Restoration Program (ERP)** amendments of 10 U.S.C. §2701, *et seq.* **New York State Department of Environmental Conservation (NYSDEC)**

October 2011

is the lead regulatory agency in accordance with the requirements of the New York State **Resource Conservation and Recovery Act (RCRA)** Hazardous Waste Permit for the facility (NYSDEC 1-4730-00013/00001-0) dated March 25, 1992. The U.S. Environmental Protection Agency (USEPA) supports NYSDEC in its oversight activities in accordance with the requirements of the previous USEPA facility permit (USEPA ID Number NYD003995198) dated May 11, 1992. NWIRP Calverton is also listed as a New York State Superfund site (Site Code 152136) and, as such, the Navy also addresses the requirements of Title 6 of the New York Codes, Rules, and Regulations (NYCRR), Part 375 through the **Applicable or Relevant and Appropriate Requirements (ARARs)** process of CERCLA.

This Proposed Plan summarizes the remedial alternatives evaluated for the Southern Area groundwater contamination. Additional information can be found in the Phase 2 **Remedial Investigation (RI)** Report for Site 6A, several RI Addendums for associated groundwater investigations, Annual Groundwater Monitoring Reports, the March 2011 **Corrective Measures Study (CMS)/Feasibility Study (FS)**, which also provides a summary of the previous investigations and the August 2011 CMS Addendum. The **Administrative Record and Information Repository** for NWIRP Calverton provide all of the reference documents. A glossary of terms used in this Proposed Plan is attached.

### Mark Your Calendar for the Public Comment Period

#### Public Comment Period

October 27-December 12, 2011

#### Submit Written Comments



The Navy will accept written comments on the Proposed Plan during the public comment period. To submit comments or obtain further information, please refer to the insert page.

#### Attend the Public Meeting

November 3, 2011

Time - 5:30 to 6:30 pm

Place - Calverton Community Center  
Grumman Blvd.  
Calverton, New York



The Navy will hold a public meeting to explain the Proposed Plan. Verbal and written comments will be accepted at this meeting.

#### Location of Information Repository

Riverhead Free Library  
330 Court Street  
Riverhead, NY 11901-2885  
(631) 727-3228

The Navy, in consultation with the NYSDEC, will make the final decision on the remedial approach for the Southern Area Groundwater Plume after reviewing and considering all information submitted during the 60-day public **comment period**. The Preferred Alternative or another **remedial action** may be selected based on new information and/or public comments received. Therefore, public participation is encouraged.

Eight site-wide alternatives were evaluated for the Southern Area Groundwater Plume (Attainment Area), with area-specific components including: no action, **monitored natural attenuation (MNA)**, LUCs in all areas; and active treatment at the **Source Area**, Fenceline Area, Off-Site Southern Area (VOCs greater than 500 µg/L[micrograms per liter]), Off-Site Southern Area (VOCs less than 500 µg/L), and the Peconic River Area. Active treatment options consist of air sparging, enhanced **in-situ biodegradation**, and groundwater extraction, treatment, and discharge.

The Navy has established an Information Repository, which contains the documents used to support the Navy's Preferred Alternative.

Riverhead Free Library

330 Court Street  
Riverhead, New York 11901-2885  
(631) 727-3228

These documents can also be accessed at a public website at:

[https://portal.navfac.navy.mil/portal/page/portal/navfac/navfac\\_ww\\_pp/navfac\\_hq\\_pp/navfac\\_env\\_pp/env\\_restoration\\_installations/lant/midlant/calverton/records](https://portal.navfac.navy.mil/portal/page/portal/navfac/navfac_ww_pp/navfac_hq_pp/navfac_env_pp/env_restoration_installations/lant/midlant/calverton/records)

## 2 BACKGROUND

NWIRP Calverton was established in 1954 for the development, assembly, testing, refitting, and retrofitting of Naval combat aircraft. It is located near the eastern portion of Long Island, approximately 70 miles east of New York City and 3 miles south of the Long Island Sound (Figure 1). Approximately ¼ mile south of the NWIRP is the Peconic River, which flows northeast and then to the east and empties into the Peconic Bay (Figures 1 and 2). In the mid 1990's, the facility consisted of approximately 3,000 acres located within a security fence and an additional 3,000 acres of buffer property located outside of the security fence. In 1996, operations at the facility ended. Currently, the entire facility, except for 209 acres, has been transferred to Town of Riverhead, NYSDEC, and the Veterans Administration. The 209 acres are being held to allow for continuing environmental investigations and remediation.

### 2.1 Site Description and Background

In support of the NWIRP Calverton mission, Sites 6A – Fuel Calibration Area and 10B – Engine Test House were used in the testing of aircraft fuel and engine systems from the late 1950's to 1996. During most of these operations, there was no secondary containment in place, and spills of fuels and waste oils to the ground surface likely occurred. Given that the groundwater table is shallow and the soil is permeable sand, releases to the ground surface would

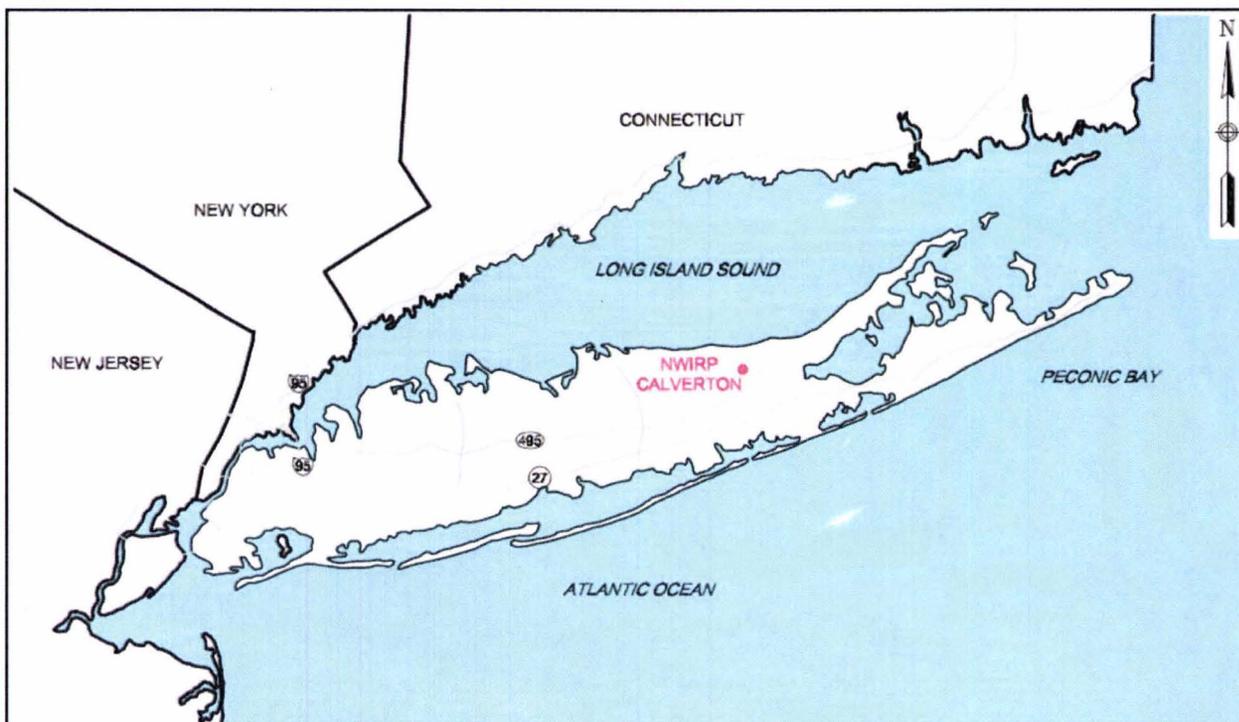


Figure 1-Facility Location Map

leach to and affect the groundwater. Between 2008 and 2010, during the remediation of site soils, structures located at these sites were demolished and the area is currently a relatively flat grassy field.

## 2.2 Summary of Previous Investigations

Several investigations were conducted for the Southern Area groundwater. These investigations have focused on the presence of fuel- and solvent-related VOCs, and are discussed below.

In 1974, Suffolk County Department of Health Services (SCDHS) installed two monitoring wells in what is currently referred to as the Southern Area and conducted several rounds of groundwater sampling from 1977 to 1993. VOCs were periodically detected in these wells.

Since 1994 the Navy has conducted several investigations in the Southern Area, which include; the 1995 RCRA Facility Investigation, 2001 Phase 2 Remedial Investigation, several supplemental groundwater investigations, the 2006 FS/CMS for Onsite Soil and Groundwater, 2008 to 2011 annual groundwater activities,

and the 2011 CMS/FS (Southern Area Groundwater Plume) and Addendum. Other activities conducted during this period are discussed below. These documents can be found in the **Public Repository** and Administrative Record.

In 2001, SCDHS sampled and analyzed potable water samples from a local sportsman's club in the Off-Site Southern Area. Because VOCs were detected on two supply wells, one well was shut down and treatment was placed on the second well. Two other drinking water wells on the property have not been impacted. To ensure protection of human health, sample collection and analysis of the water supplies continues to be monitored by the Navy. In 2011, a municipal potable water supply line is being extended to supply the PRSC with potable water, at which time additional monitoring will no longer be required.

In 2008 and 2009, SCDHS conducted groundwater investigations in the Southern Area. These investigations identified the presence of VOCs in groundwater down gradient of the NWIRP.

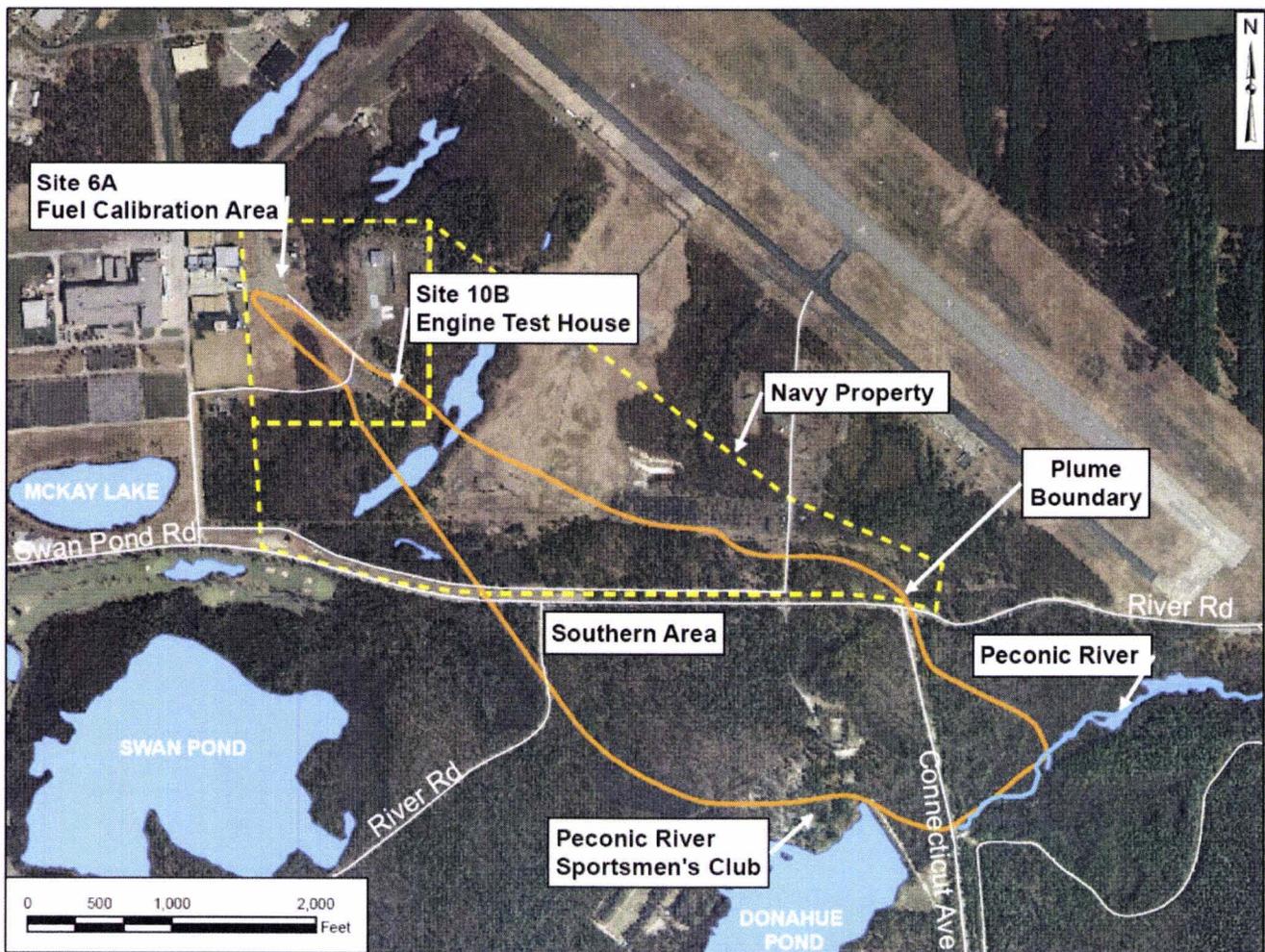


Figure 2-Site Location Map

From 2008 to 2010, remedial actions were conducted at the former source areas, Sites 6A and 10B. The remedial action at Site 6A included the excavation of 2,888 tons of solvent/petroleum contaminated soil, 17,690 tons of petroleum-contaminated soil, and 498 tons of PCB-contaminated soil. Approximately 5,200 pounds of an **oxygen-release compound (ORC)**, were applied at the base of the excavation to treat any residual contamination. The remedial action at Site 10B included the excavation of approximately 5,700 tons of petroleum-contaminated soil and 49 tons of PCB-contaminated soil. Approximately 1,900 pounds of an ORC were applied to the base of the excavation to treat any residual contamination.

Several public meetings took place in the early 1990s that provided initial public notice of environmental issues at NWIRP Calverton. A Restoration Advisory Board (RAB) was created in 1997 and meets approximately three times per year to inform the community on environmental issues at NWIRP Calverton. The RAB is comprised of members of the community, local environment groups, and state and federal representatives. The Southern Area Groundwater Plume and the CMS/FS alternatives have been discussed at recent RAB meetings and regulator and public input on the proposed remedy described herein has been considered in the decision making process.

### 3 SITE CHARACTERISTICS

The Southern Area Groundwater Plume is VOC-contaminated groundwater located hydraulically down gradient of NWIRP ER Sites 6A and 10B, which extends to the southeast to the Peconic River. As a result of relatively flat, sandy soils, and/or proximity to the Peconic River; **Pine Barrens** and wetlands are common throughout the Southern Area (see Figure 3).

This area is also a Tiger Salamander habitat, a state-endangered species. The Peconic River is classified as a New York Wild, Scenic, and Recreational River. In addition, groundwater in the area is classified as a sole source drinking water aquifer and patrons of the Peconic River Sportsman's Club (PRSC) were identified as users within the Southern Area Groundwater Plume.

Currently, occupied structures overlaying the Southern Area Groundwater Plume are limited to several buildings at the PRSC in the offsite portion of the Southern Area. A soil vapor intrusion investigation conducted at the PRSC in February 2011 did not find evidence of impact from VOCs in groundwater.

Sites 6A and 10B are relatively flat, grassy fields and groundwater is typically 4 to 8 feet below ground surface.

A drainage swale in the area is used to convey excess precipitation from this area to a series of interconnected ponds and eventually to the Peconic River. Since the soils



**Figure 3-Pine Barrens, wetlands, and Tiger Salamander Habitat including 500-ft buffer**

are very permeable, surface flow normally only occurs during periods of sustained precipitation, at which time the groundwater table rises to near the surface. To the southeast, the depth to groundwater varies based on the surface topography, with a maximum depth of approximately 17 feet.

#### 3.1 Nature and Extent of Contamination

The Southern Area Groundwater Plume starts in the area of Site 6A and extends to the southeast, until it encounters the Peconic River. From Site 6A to the fence line, the width of the groundwater plume is approximately 150 to 200 feet and 5 to 15 feet thick. The plume generally dips as it moves south, but is limited by an aquitard at a depth of approximately 50 to 60 feet below ground surface. South of the fence line, the plume expands to a width of approximately 2,000 feet, 50 feet thick, and to a depth of 100 feet. See Figures 4 and 5, on page 5.

Within this plume, there is approximately 340 million gallons of VOC-impacted groundwater that contains an estimated 375 pounds of VOCs.

Site-related contaminants of concern are comprised of VOCs [1,1,1-trichloroethane (TCA)] and associated degradation products and fuels (e.g., xylene) (see Table 1

in section 6). 1,1-Dichloroethane (DCA, a degradation product of TCA), is the most prevalent VOC in the plume with a maximum detection of 2,100 µg/L. Approximately 25 percent (93 pounds) of the VOCs is located On-Site (north of the fence line) and 75 percent (282 pounds) is located Off-Site (south of the fence line). Di- and tri-chlorinated benzene compounds are also present. These **Chemicals of Concern (COCs)** were identified because the maximum detected concentration in groundwater was greater than either groundwater or surface water standards.

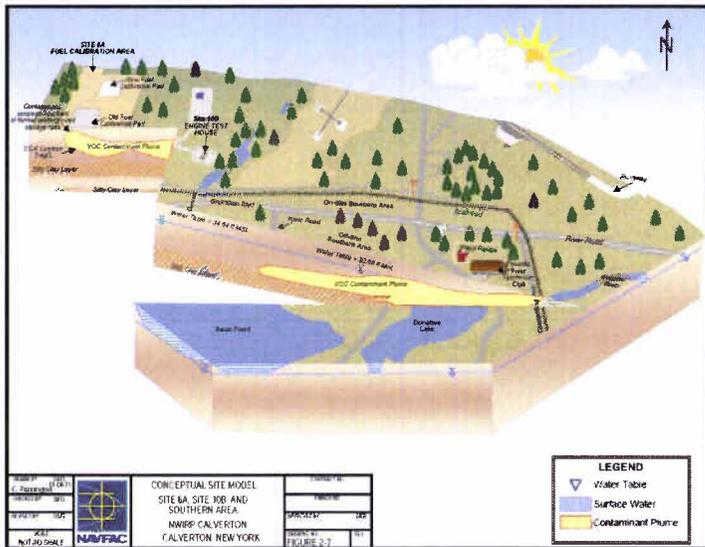


Figure 4-Conceptual Site Model of Southern Area Groundwater Plume

### 3.2 Fate and Transport of Contamination

The primary **contaminant migration pathway** for VOCs in the Southern Area is through groundwater flow in the shallow aquifer. Drainage swales and overland transport may also transport VOCs during periods of sustained precipitation. There is evidence that the VOCs are degrading through biological and chemical reactions, as well as decreasing in concentration through advection and dispersion. VOC concentrations in groundwater decrease from approximately 2,100 µg/L near the Source Areas to approximately 50 µg/L near the Peconic River. Within the Peconic River, VOCs have been periodically detected, but at concentrations below surface water quality criteria and drinking water standards.

### 3.3 Principal Threats

From 1988 to 1993, Grumman Corporation operated a groundwater and free product extraction system at Site 6A to collect floating free product. Manual free product recovery, via hand bailing, continued from 1993 to 1996. In 2000, manual free product recovery was resumed by the Navy until only residual free product remained. A total of 1,900 gallons of fuel-related product was recovered during this period. The remaining principal threat wastes

consisted of polychlorinated biphenyl (PCB) -, petroleum- and/or solvent-contaminated soil at Sites 6A and 10B, which were removed during excavation activities in 2008 to 2010. This action is expected to have removed most or all of the wastes that caused the Southern Area Groundwater Plume. Groundwater monitoring is being conducted to evaluate and confirm the effectiveness of the Source Area remedies. In the event that principal threat wastes remain at Sites 6A or 10B, the Preferred Alternative includes a provision for implementing an air sparging system.

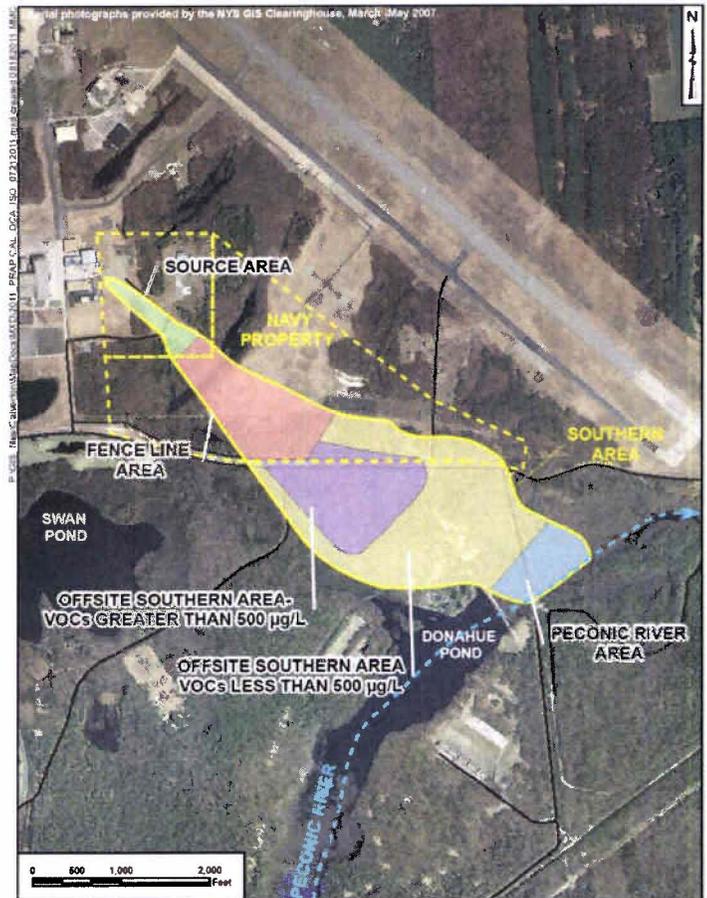


Figure 5-Southern Area Groundwater Plume Remedy Areas

## 4 SCOPE AND ROLE

This Proposed Plan presents the Navy's Preferred Alternative for addressing VOC-contaminated groundwater in the Southern Area. VOCs are present in the groundwater at concentrations that exceed NYSDOH drinking water **standards (maximum contaminant levels [MCLs])**.

The Navy's cleanup strategy for the Southern Area Groundwater Plume is summarized as follows:

- Continue to monitor groundwater in the source areas to determine if there is need for additional action;

- Implement a groundwater extraction, treatment, and discharge remedy near the property line (Fence Line) to reduce or eliminate the off site migration of VOC-contaminated groundwater;
- Continue to monitor plume migration and attenuation in the offsite groundwater to determine whether additional action is required to protect ecological receptors; and
- Implement LUCs to prevent human consumption of VOC-contaminated groundwater until remediation goals have been met.

Additional source area or other onsite remedial actions would be considered in order to optimize the operation and shutdown of the Fence Line Treatment System. Additional offsite remedial actions would also be considered if, based on monitoring data, it is determined that VOC-contaminated groundwater may adversely impact ecological receptors in the Peconic River. The Navy intends its preferred alternative, as identified in this Proposed Plan, to be the final response action for the Southern Area.

It is the current judgment of the Navy, in consultation with the NYSDEC that the preferred alternative identified in this Proposed Plan is necessary to protect public health, welfare, and the environment from actual or threatened releases of hazardous substances into the environment. The On-Site portion of the Southern Area is currently owned by the Navy. Once the property meets certain environmental conditions, it will be transferred to the Town of Riverhead for economic redevelopment. The Off-Site Southern Area also consists of several parcels that are owned by New York State, Suffolk County, and Peconic River Sportsman's Club (PRSC).

Future land use is anticipated to be consistent with current land use, which is primarily environmental conservation and recreational use. Since this area is classified as a sole source aquifer, in the future there is a potential that groundwater may be used as a drinking water source. However, there are no current plans for installing potable water wells in this area. Detailed results of the **human health risk assessment** are presented in the RI Report. An **ecological risk assessment** is provided in the CMS/FS.

## 5 SUMMARY OF SITE RISKS

### 5.1 Human Health Risk Assessment

As part of the 1995 RFI, the Navy conducted a baseline risk assessment for the former source area (Site 6A) that evaluated exposure to contaminated soil and groundwater. The VOCs detected in the Southern Area Groundwater Plume are similar to those found in the groundwater at Site 6A, but concentrations are generally a factor of 5 to 10 times less than used during the baseline risk assessment. The risks from exposure to the groundwater in the Southern Area Groundwater Plume would be comparable

## What is Human Health Risk and How is it Calculated?

A human health risk assessment estimates the "baseline risk." This is an estimate of the likelihood of health problems occurring if no cleanup action were taken at a site. To estimate the baseline risk at a site, the Navy performs the following 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 concentrations 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 help 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 (how often) and length of exposure. Using this information, the Navy calculates a "reasonable maximum exposure (RME) scenario that 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 Navy considers two types of risk: (1) cancer risk, and (2) noncancer risk. The likelihood of any kind of cancer resulting from a contaminated 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 normally would be expected to from all other causes. For non cancer health effects, the Navy calculates a "hazard index." The **hazard index** represents the ratio between the "reference dose", the dosage at which no adverse health effects are expected to occur, and the "reasonable maximum exposure", the estimated maximum exposure level for a given category of individuals coming into contact with contaminants at the Site. The key concept here is that a "threshold level" (measured usually as a hazard index of less than 1) exists below which noncancer 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 and exposure pathways and calculates a total site risk.

to, but likely lower than, the risks from exposure to groundwater at Site 6A calculated during the 1995 baseline risk assessment. From the baseline risk assessment for Site 6A, the following conclusions were developed: (1) there is no unacceptable risk to current site workers; under future potential residential use of the site, (2) there is no unacceptable risks from exposure to soils, but (3) there are unacceptable **carcinogenic** and **non-carcinogenic** risk associated with residential exposure to groundwater, due to both ingestion and inhalation of VOCs.

The calculated **incremental life-time cancer risk (ILCR)** for a future **resident** at Site 6A is  $2.5 \times 10^{-3}$  and the hazard indices for the future adult resident and future child resident are 8.9 and 23.6, respectively. Ingestion and inhalation of vapors associated with VOC-impacted groundwater were the primary contributors to risk. An ILCR greater than  $10^{-4}$  or a **hazard index** greater than 1 is considered under CERCLA to be unacceptable.

## 5.2 Ecological Risk Assessment

Under current conditions, the Southern Area Groundwater Plume was not identified as resulting in adverse risks to ecological receptors risks. At the request of the community in 2010, NYSDEC evaluated water quality standards and guidance values for chemicals in the Southern Area Groundwater Plume in order to protect aquatic organisms. No published standards or guidance values are available for several of these chemicals so the NYSDEC Division of Fish, Wildlife and Marine Resources developed appropriate risk thresholds for protection of aquatic life. None of these thresholds were exceeded. Surface water and groundwater results were also compared to Federal ecological screening values derived by Oakridge National Laboratories. Surface water results are also less than ecological screening values indicating that current adverse effects are not anticipated. Some of the groundwater results were noted to exceed ecological screening values for surface water, which indicates that if Southern Area groundwater migrates without attenuation and enters the Peconic River, localized short-term impacts to ecological receptors may occur. Since the site related VOCs do not **bioaccumulate** or **biomagnify**, adverse impacts to upper food chain receptors would not be anticipated. Because of dilution and volatilization, this discharge would not adversely affect the surface water quality.

## 6 REMEDIAL ACTION OBJECTIVES

The **Remedial Action Objectives** are statements that define the extent to which sites require cleanup to protect human health and the environment and comply with ARARs. The objectives reflect the COCs, exposure routes and receptors, and acceptable chemical concentrations (or range of acceptable chemical concentrations) for groundwater at the Southern Area. The Remedial Action

Objectives for the Southern Area Groundwater Plume are as follows:

### Groundwater

- Prevent human exposure to groundwater containing COCs above cleanup levels.
- Allow for unlimited use of groundwater (cleanup levels) within a reasonable timeframe.
- Prevent migration or discharge of COCs in groundwater to sediment and surface water at levels that would cause unacceptable risks to human or ecological receptors.

### Soil Vapor Intrusion Indoor Air

- Prevent unacceptable risks to human receptors from exposure to vapors resulting from subsurface site-related COCs.

To address these risks, preliminary remediation goals (PRGs) were developed based on USEPA MCLs and NYSDOH MCLs in groundwater, see Table 1.

Groundwater Chemical of Concern	NYSDOH MCL <sup>(1)</sup> (µg/L)
Benzene	5
Chloroethane	5
Dichlorobenzene, 1,2- (ortho)	5
Dichlorobenzene, 1,3- (meta)	5
Dichlorobenzene, 1,4- (para)	5
Dichloroethane, 1,1-	5
Dichloroethene, 1,1-	5
Ethylbenzene	5
Isopropyl Benzene	5
Methylene Chloride	5
Naphthalene	50
Tetrachloroethene	5
Trichlorobenzene, 1,2,4-	5
Trichloroethane, 1,1,1-	5
Vinyl Chloride	2
Xylene	5

**Table 1-Preliminary Remediation Goals (PRGs)**

Notes:

µg/L-micrograms per liter

1. New York State Department of Health (NYSDOH) Maximum Contaminant Level (MCL). 10 NYCRR, Part 5, Subpart 5-1 Public Water Systems,

Tables 1 through 3.

[http://www.health.ny.gov/regulations/nycrr/title\\_10/part\\_5/subpart\\_5-1\\_tables.htm#table1](http://www.health.ny.gov/regulations/nycrr/title_10/part_5/subpart_5-1_tables.htm#table1).

## 7 SUMMARY OF REMEDIAL ALTERNATIVES

Remedial alternatives to address the potential risks associated with VOC-contaminated groundwater in the Southern Area and to achieve Remedial Action Objectives (RAO) were developed. In order to develop these alternatives, possible remedial activities were screened for effectiveness, implementability and cost. Based upon the results of the detailed screening of potential remediation technologies, seven remedial alternatives were developed, and are described as follows.

### Alternative 1: No Action

Regulations governing the Superfund program generally require that the "No Action" alternative be evaluated generally to establish a baseline for comparison. Under this alternative, the Navy would take No Action to prevent exposure to the VOC-contaminated groundwater. Additionally, the No Action alternative does not include monitoring the **contaminant plume** in groundwater or five-year reviews.

### Alternative 2: Land Use Controls

This alternative consists of LUCs. The LUCs would target areas that require notifications and inspections during the operation of this alternative, until clean up goals are achieved. Additionally, this alternative would identify the need for monitoring and/or mitigation to address the potential for soil vapor intrusion issues. Groundwater use restrictions would be identified in the **Record of Decision (ROD)**. The Navy is planning on transferring its property to the Town of Riverhead for economic redevelopment and the transfer documents restrict groundwater use and identify areas of residual contamination. Once the property is no longer under Navy control, and annual inspections would identify potential wells that could result in adverse impacts to human health. Annual **site inspections** would be conducted to ensure that groundwater use restrictions are maintained and identify buildings that may be affected by potential soil vapor intrusion issues. A reevaluation of the site would be performed every 5 years to determine whether any changes to the controls or remedy would be required.

### Alternative 3: Monitored Natural Attenuation and Land Use Controls

This alternative consists of monitored natural attenuation (MNA) and LUCs. Like Alternative 2, LUCs would target areas that require notifications and inspections during the operation of this alternative, until clean up goals are achieved. The Navy is planning on transferring its property to the Town of Riverhead for economic redevelopment and the transfer documents restrict groundwater use and identify areas of residual contamination. Once the property is no longer under Navy control, groundwater monitoring and annual inspections would identify potential wells that

could result in adverse impacts to human health. MNA would be used to evaluate VOC migration through the Southern Area and evaluate potential adverse impacts to the Peconic River. The existing monitoring well network and monitoring plan would be evaluated and if necessary modified to ensure an adequate evaluation of plume migration.

### Alternative 4: Air Sparge, Monitored Natural Attenuation, and Land Use Controls

This alternative consists of implementing LUCs, MNA, and installing and operating an air sparge treatment system in the former source area and/or near the Peconic River area. The LUCs would target areas that require notifications and inspections during implementation of this alternative, until clean up goals are achieved as described in Alternative 2. MNA would target areas between treatment zones and portions of the groundwater plume with lower VOC concentrations (less than 50 µg/L) and/or where treatment cannot be effectively implemented because of site features that would inhibit intrusive activities (e.g., wetlands). The Source Area Air Sparge System would consist of one to four treatment lines. The final setup and number of treatment lines would be based on the ongoing source area groundwater monitoring and would be finalized during the **Remedial Design** to optimize performance in this area.

Some air sparge wells and monitoring wells would be installed near or in wetlands and groundwater sampling would be conducted in these same areas

This alternative would result in the volatilization and photodegradation of approximately 21 pounds of VOCs from the source area and up to 354 pounds of VOCs at the Peconic River. The estimated time to reach cleanup levels in the River Area Air Sparge System is 16 years. Within approximately 2 to 4 years, PRGs should be obtained in the source area.

### Alternative 5: Anaerobic Enhanced In-situ Bioremediation, Monitored Natural Attenuation, and Land Use Controls

This alternative consists of implementing LUCs, MNA, and installing and operating an anaerobic Enhanced **In-situ Bioremediation** (EISB) system between the source area and downgradient portions of the Southern Area. The LUCs would target areas that require notifications and inspections during implementation of this alternative, until clean up goals are achieved as described in Alternative 2. MNA would target areas between treatment zones and portions of the groundwater plume with lower VOC concentrations and/or where treatment cannot be effectively implemented because of site features that would inhibit intrusive activities (e.g., wetlands). The Anaerobic EISB Systems would consist of one to five Biobarriers (Nos. 1 to 5) containing approximately 20 to 25

permanent 4-inch polyvinyl chloride injection wells. The final setup and number of treatment lines would be based on the ongoing groundwater monitoring and would be finalized during the Remedial Design to optimize performance in the source area and the rest of the onsite area.

Approximately 350 gallons of emulsified vegetable oil and 16,000 gallons of potable water would be injected into each well. If all 113 injection wells are required, a total of 40,000 gallons of emulsified vegetable oil and 1,800,000 gallons of potable water would be required. A second injection is assumed to be required five years after the first injection.

Some injection wells and monitoring wells would be installed near or in wetlands and groundwater sampling would be conducted in these same areas. In addition, the emulsified vegetable oil would be stored and mixed in areas adjacent to surface water and wetlands and injected under or near wetland areas.

Within approximately 4 to 8 years, PRGs should be obtained in the areas treated by the Anaerobic EISB and approximately 150 pounds of VOCs would be destroyed through biodegradation.

### **Alternative 6: Anaerobic Enhanced In-situ Bioremediation, Air Sparge, Monitored Natural Attenuation, and Land Use Controls**

This Alternative is a combination of Alternatives 4 and 5, and consists of Anaerobic EISB, Air Sparge, MNA, and LUCs. The primary difference between Alternative 6 and a combination of Alternatives 4 and 5 is that the Source Area Air Sparge System would not be implemented. Instead, two Biobarriers would be used to treat VOC-contaminated groundwater in that area. This alternative includes aggressive treatment of all VOC-contaminated groundwater with DCA concentrations greater than 500 µg/L (onsite and offsite), and the majority of the onsite plume with DCA concentrations greater than 50 µg/L. The Peconic River Area Air Sparge would be used to treat VOCs that have migrated beyond the Biobarriers and also residual soluble organics and iron. The estimated time to reach cleanup levels in the Peconic River Area Air Sparge System is dependent on the implementation of source area treatment and the effectiveness of MNA in groundwater upgradient of this area. The cleanup time is estimated at 10 years.

### **Alternative 7: Groundwater Extraction, Treatment, and Injection, Monitored Natural Attenuation, and Land Use Controls**

This alternative consists of implementing LUCs, MNA, and installing and operating a groundwater extraction, treatment, and injection at the Navy fence line (property line) north of River Road and/or near the Peconic River

area. The LUCs would target areas that require notifications and inspections during the operation of this alternative until clean up goals are achieved as described in Alternative 2. MNA would target areas between treatment zones and portions of the groundwater plume with lower VOC concentrations and/or where treatment cannot be effectively implemented because of site features that would inhibit intrusive activities (e.g., wetlands). One groundwater extraction well removing 100 gallons per minute of groundwater would be installed near the intersection of River Road and Grumman Boulevard (Fence Line Area) and two groundwater wells removing a total of 200 gallons per minute would be installed near Connecticut Avenue (Peconic River Area). These wells would capture the estimated width of the VOC-impacted groundwater at these areas, as follows:

Fence Line Area:	400 feet wide
Peconic River Area:	1,000 feet wide

In addition, the groundwater extraction wells would be installed in or near wetlands, in endangered species habitat, and within the Wild, Scenic, and Recreational Rivers Act buffer zone.

Some groundwater extraction wells and monitoring wells would be installed near or in wetlands and groundwater sampling would be conducted in these same areas.

The cleanup time is estimated at 16 years. This alternative would result in the volatilization and photodegradation of approximately 93 pound of VOCs from the Fence Line Area and up to 282 pounds of VOCs at the River Area.

### **Alternative 8: Fenceline Groundwater Extraction, Treatment, and Discharge, LUCs and Monitoring**

In addition, to further describe and evaluate these alternatives an Addendum to the CMS/FS was prepared in August 2011. This addendum considers the same technologies provided in the CMS, but details Area-Specific components. In total, 384 site-wide alternatives could be developed. The five areas and the area-specific components evaluated in the Addendum are as follows (see Figure 5):

**Source Area:** Alternative 1 - No Action; Alternative 2 - LUCs and Monitoring; Alternative 3 - Air Sparging, LUCs, and Monitoring; and Alternative 4 - Anaerobic Biodegradation, LUCs, and Monitoring.

**Fence Line Area:** Alternative 1 - No Action; Alternative 2 - LUCs and Monitoring; Alternative 3 - Anaerobic Biodegradation, LUCs, and Monitoring; and Alternative 4 - Extraction, Treatment, and Discharge, LUCs, and Monitoring.

**Offsite Southern Area (VOCs greater than 500 µg/L):** Alternative 1 - No Action; Alternative 2 - LUCs and Monitoring; and Alternative 3 - Anaerobic Biodegradation, LUCs, and Monitoring.

**Offsite Southern Area (VOCs less than 500 µg/L):** Alternative 1 - No Action and Alternative 2 - LUCs and Monitoring.

**Peconic River Area:** Alternative 1 - No Action; Alternative 2 - LUCs and Monitoring; Alternative 3 - Air Sparging, LUCs, and Monitoring; and Alternative 4 - Extraction, Treatment, and Discharge, LUCs, and Monitoring.

As part of the CMS Addendum, the Navy identified a recommended alternative for each area, which is now being referred to as Alternative 8. In addition, based on an evaluation of monitoring results to be collected during implementation of the remedy, Alternative 8 also includes contingency remedies.

Alternative 8 consists of a groundwater extraction treatment, and discharge system at the NWIRP Calverton Southern Area property line (Fence Line), and LUCs and MNA for the remainder of the area. Based on monitoring data, this alternative also includes contingencies for: air sparging in the Source Area; anaerobic biodegradation in the Offsite Southern Area (VOCs greater than 500 µg/L); and air sparging at the Peconic River Area.

## 8 EVALUATION OF ALTERNATIVES

The remedial alternatives were analyzed in detail and compared to each other using seven of the nine criteria provided in the National Oil and Hazardous Substance Pollution Contingency Plan (NCP) (40 CFR 300.430 (e)(9)(iii)). An evaluation of the eight site-wide alternatives is provided in Table 2 on page 11, in accordance with the criteria described as follows:

### Threshold Criteria

- Overall Protection of Human Health and the Environment
- Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)

### Primary Balancing Criteria

- Long-term Effectiveness and Permanence
- Reduction of Contaminant Toxicity, Mobility, or Volume through Treatment
- Short-term Effectiveness
- Implementability

- Cost

The remaining two criteria, State Acceptance and Community Acceptance, referred to as Modifying Criteria, are also considered in selecting a remedy. NYSDEC has been consulted in selecting the preferred alternative but final State comments will not be submitted until after the community has had an opportunity to participate in the selection process. Community Acceptance is evaluated based on comments received during the public comment period. Additional information on the evaluation criteria can be found in on page 13 "How are Remedial Alternatives Evaluated".

## 9 SUMMARY OF THE PREFERRED ALTERNATIVE

The Navy's preferred alternative for the Southern Area Groundwater Plume is Alternative 8, which is presented in this Section. Figure 6 on page 12, provides a summary of the Area-specific remedies

The preferred alternative consists of Land Use Controls (LUCs), monitoring, and the installation and operation of a groundwater extraction, treatment, and discharge system at the NWIRP southern property line (Fence Line Treatment System). Also, based on monitoring data and contaminant trend analysis, the preferred alternative includes the potential installation and operation of an air sparging system at the Source Area, In-situ Biodegradation in the Offsite Southern Area (VOCs greater than 500 µg/L), and Air Sparging at the Peconic River Area.

The LUCs would be implemented in each area to protect human health until cleanup goals are achieved. The LUCs would consist of restrictions on the use of VOC-impacted groundwater, annual inspections, and provisions for addressing soil vapor intrusion for new building construction in areas with VOC-contaminated groundwater. As VOC concentrations in groundwater decrease, LUCs boundaries may be modified. Monitoring would be conducted in each area to evaluate the presence and migration of VOC-contaminated groundwater. The monitoring would be used in combination with trigger values to be established in the Remedial Design to remove areas from further consideration, modify the operation of the existing treatment system, and if needed, implement additional groundwater treatment.

The preferred remedy complements the two source areas (Sites 6A and 10B) remedial actions that were completed in 2010. These actions have minimized the continuing impact to groundwater. The preferred alternative includes monitoring the former source area for VOC-contaminated groundwater, with the potential for implementing an air sparging system(s) to optimize operation of the Fence Line Treatment System. In addition, a water line extension to the PRSC, which is scheduled for 2011, will eliminate

Criterion	Alternative 2 Land Use Controls	Alternative 3 – Monitored Natural Attenuation, and LUCs	Alternative 4 Air Sparging, MNA, and LUCs	Alternative 5 – Anaerobic Enhanced In-Situ Biodegradation, MNA, and LUCs	Alternative 6 – Air Sparging, EISB, MNA, and LUCs	Alternative 7 – Groundwater, Extraction, and Discharge, MNA, and LUCs	Alternative 8 - Fence Line Groundwater Extraction, Treatment, and Discharge, LUCs and Monitoring
Overall Protection of Human Health and the Environment	●	●	●	●	●	●	●
Compliance with ARARs	○	●	●	●	●	●	●
Reduction of Toxicity, Mobility, or Volume through Treatment	○	○	●	●	●	●	●
Long-Term Effectiveness	○	○	●	●	●	●	●
Short-Term Effectiveness	○	●	●	●	○	○	●
Implementability	●	●	○	○	○	○	●
Time to Reach RAOs (Years)	20	20	16	10	10	16	16
Cost							
Capital	\$8k	\$314k	\$3,400k	\$3,700k	\$5,600k	\$4,700k	\$1,650k
O&M	\$7k to 21k/Yr	\$127 to 219k/Yr	\$367k to 861k/Yr	\$140k to 1,359k/Yr	\$370k to 1,463k/Yr	\$1,087k to \$1,330k/Yr	\$21k to \$526k
Present Value	\$207k	\$2,400k	\$9,600k	\$6,700k	\$9,600k	\$20,000k	\$4,660k

Ranking: ● High ○ Moderate ○ Low

**Table 2-Relative Ranking of Alternatives**

human potential exposure to VOC-contaminated groundwater.

The Fence Line Treatment System will use air stripping to remove an estimated total of 93 pounds of VOCs from 210 million gallons of groundwater over a 4-year period. Based on groundwater monitoring, the Fence Line Treatment System may operate more than 4 years. These VOCs will be permanently destroyed via photochemical oxidation in the atmosphere. The treated water will be recharged into the local aquifer to maintain natural groundwater flow in the area and to the Peconic River.

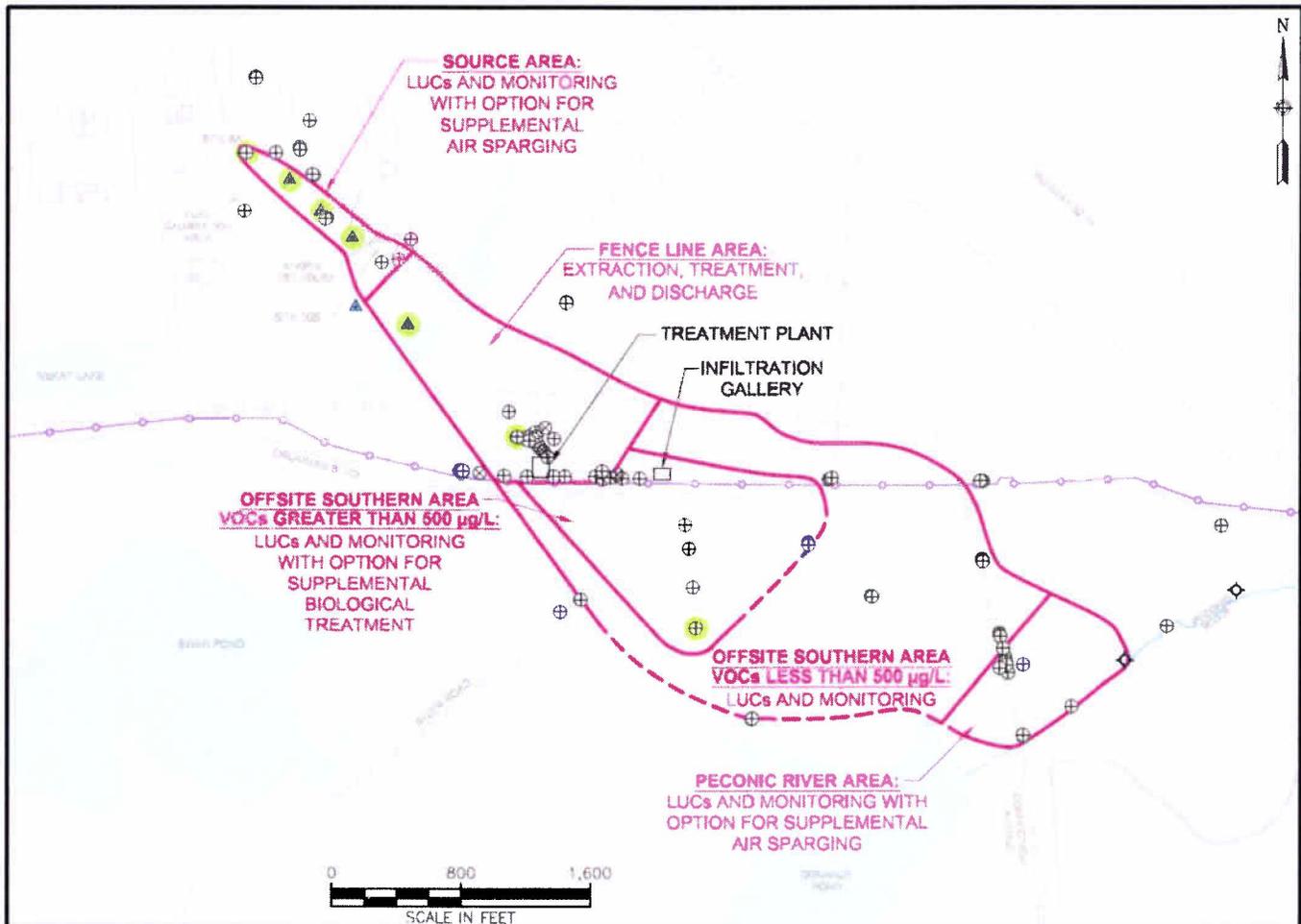
Based on a groundwater monitoring program and trigger values established in the Remedial Design, In-Situ Biodegradation in the Offsite Southern Area (VOCs greater than 500 µg/L) and Air Sparging at the Peconic River may also be implemented. The need for these additional treatment remedies would be based on potential or actual sustained threats to ecological receptors in the Peconic River.

The estimated capital and **present value** cost of the Preferred Alternative is \$1,650,000 and \$4,660,000, respectively. Annual costs vary significantly based on the activity being conducted in each year and range from

early-year operation, monitoring, and maintenance costs for the Fence Line Treatment System of \$526,000 per year to out-year inspection costs of approximately \$21,000 per year.

The preferred alternative was based on a careful evaluation of the nine criteria. Potential exposure to human health is limited and would be further controlled via LUCs and monitoring. Treatment would be used for groundwater contamination that can be effectively captured at the Fence Line Area. Monitoring would continue to be conducted in this area, but with minimal environmental impact. Additional treatment would be considered in the down gradient areas, but only if monitoring data demonstrates that ecological receptors will be adversely impacted.

Based on information currently available, the lead agency believes the Preferred Alternative meets the threshold criteria and provides the best balance of tradeoffs among the other alternatives with respect to the balancing and modifying criteria. The Navy expects the Preferred Alternative to satisfy the following statutory requirements of CERCLA §121(b): 1) be protective of human health and the environment; 2) comply with ARARs; 3) be cost-effective; 4) utilize permanent solutions and alternative



**Figure 6-Summary of Area-Specific Remedies of the Preferred Alternative**

treatment technologies or resource recovery technologies to the maximum extent practicable; and 5) satisfy the preference for treatment as a principal element. The Preferred Alternative can change in response to public comments or new information a principal element.

section of the Decision Document. The Decision Document is the Navy's final selection of the remedy for this site. Written comments may be sent to the Public Affairs Officer at the address below

## 10 COMMUNITY PARTICIPATION

The Navy seeks input from the community on all Proposed Plans. A public comment period has been set for October 27, 2011 to December 12, 2011 to provide an opportunity for public participation in the remedy selection process for this site. A public meeting is scheduled for November 3, 2011 at the Calverton Community Center beginning at 5:30 pm. At the meeting, the results of the RFI and CMS/FS will be presented along with a summary of the proposed remedy. After the presentation, a question-and-answer period will be held, during which you can submit verbal or written comments on the Proposed Plan. The Navy, in consultation with NYSDEC and SCDHS, may modify the preferred alternatives or select another of the alternatives presented in this Proposed Plan based on new information or public comments. Therefore, the public is encouraged to review and comment on all of the alternatives identified here. Comments will be summarized and responses provided in the Responsiveness Summary

During the comment period, interested parties may submit written comments to the following address:

**Public Affairs Officer  
Code 09PA  
Naval Facilities Engineering Command,  
Mid-Atlantic  
9742 Maryland Ave, Bldg. A81  
Norfolk, Virginia 23511**

## How are Remedial Alternatives Evaluated

The remedial alternatives were analyzed in detail and compared to each other using seven of the nine criteria provided in the National Oil and Hazardous Substance Pollution Contingency Plan (NCP) (40 CFR 300.430 (e)(9)(iii)). These nine criteria are as follows:

### Threshold Criteria

- Overall Protection of Human Health and the Environment
- Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)

### Primary Balancing Criteria

- Long-term Effectiveness and Permanence
- Reduction of Contaminant Toxicity, Mobility, or Volume through Treatment
- Short-term Effectiveness
- Implementability
- Cost

The remaining two criteria, State Acceptance and Community Acceptance, referred to as Modifying Criteria, are also considered in selecting a remedy. NYSDEC has been consulted in selecting the preferred alternative but final State comments will not be submitted until after the community has had an opportunity to participate in the selection process. Community Acceptance is evaluated based on comments received during the public comment period.

### Overall Protection of Human Health and the Environment

Alternatives must be assessed for adequate protection of human health and environment, in both the short and long terms, from unacceptable risks posed by hazardous substances or contaminants present at the site by eliminating, reducing, or controlling exposure to concentrations exceeding remediation goals. Overall protection draws on the assessments of other evaluation criteria, especially long-term effectiveness and permanence, short-term effectiveness, and compliance with ARARs.

### Compliance with ARARs

Alternatives must be assessed to determine whether they attain ARARs under federal environmental laws and state environmental or facility siting laws. If one or more regulations that are applicable cannot be complied with, a waiver must be invoked in accordance with CERCLA. Grounds for invoking a waiver are listed in CERCLA would depend on site circumstances and alternative remedial approaches.

### Long-Term Effectiveness and Permanence

Alternatives must be assessed for the long-term effectiveness and permanence they offer, along with the degree of certainty that the alternative will prove successful. Factors to be considered, as appropriate, include the following:

Magnitude of Residual Risk - Risk posed by untreated waste or treatment residuals at the conclusion of remedial activities. The characteristics of residuals should be considered to the degree that they remain hazardous, taking into account their volume, toxicity, mobility, and propensity to bioaccumulate.

Adequacy and Reliability of Controls - Controls such as containment systems and institutional controls that are necessary to manage treatment residuals and untreated waste must be shown to be reliable. In particular, the uncertainties associated with land disposal for providing long-term protection from residuals, assessment of the potential need to replace technical components of the alternative (such as a cap, a slurry wall, or a treatment system), and potential exposure pathways and risks posed if the remedial action would need replacement must be considered.

## How are Remedial Alternatives Evaluated (continued)

### Reduction of Toxicity, Mobility, or Volume through Treatment

The degree to which the alternative employs recycling or treatment that reduces the toxicity, mobility, or volume will be assessed, including how treatment is used to address the principal threats posed by the site. Factors to be considered, as appropriate, include the following:

- The treatment or recycling processes the alternative employs and the materials that they will treat.
- The amount of hazardous substances, pollutants, or contaminants that will be destroyed, treated, or recycled.
- The degree of expected reduction in toxicity, mobility, or volume of hazardous substances due to treatment or recycling and the specification of which reduction(s) is occurring.
- The degree to which the treatment is irreversible.
- The type and quantity of residuals that will remain following treatment considering the persistence, toxicity, mobility, and propensity to bioaccumulate of such hazardous substances and their constituents.
- The degree to which treatment reduces the inherent hazards posed by principal threats at the site.

### Short-Term Effectiveness

The short-term impacts of the alternative are assessed considering the following:

- Short-term risks that might be posed to the community during implementation.
- Potential impacts on workers during remedial action, and the effectiveness and reliability of protective measures.
- Potential environmental impacts of the remedial action, and the effectiveness and reliability of mitigative measures during implementation.
- Time until protection is achieved.

### Implementability

The ease or difficulty of implementing the alternatives is assessed by considering the following types of factors, as appropriate:

- Technical feasibility, including technical difficulties and unknowns associated with the construction and operation of a technology, the reliability of the technology, ease of undertaking additional remedial actions, and ability to monitor the effectiveness of the remedy.
- Administrative feasibility, including activities needed to coordinate with other offices and agencies, and the ability and time required to obtain necessary approvals and permits from other agencies (for off-site actions).
- Availability of services and materials, including the availability of adequate off-site treatment, storage capacity, and disposal capacity and services, availability of necessary equipment and specialists and necessary additional resources, availability of services and materials, and availability of prospective technologies.

### Cost

Capital costs to be considered include direct and indirect costs, annual O&M costs, and net present worth (NPW) of the capital and O&M costs. The NPW for the alternatives is calculated using a discount rate of 2.8 percent based on the Office of Management and Budget Circular A-94 updated in March 2008. The cost estimate accuracy range is expected to be plus 50 percent to minus 30 percent of the actual cost.

### State Acceptance

The state's concerns that must be assessed include the following:

- The state's position and key concerns related to the preferred alternative and other alternatives
- State comments on ARARs or the proposed use of waivers

These concerns cannot be evaluated until the NYSDEC has reviewed and commented on the FS. These concerns will be discussed, to the extent possible, in the Proposed Plan to be issued for public comments.

### Community Acceptance

This assessment consists of responses of the community to the Proposed Plan and includes determining which components of the alternatives interested persons in the community support, have reservations about, or oppose. This assessment can be completed after comments on the Proposed Plan are received from the public.

## Glossary of Terms

**Administrative Record:** An official compilation of site-related documents, data, reports, and other information that are considered important to the status of and decisions made relative to a Superfund site. The public has access to this material.

**Air Sparging:** Air sparging reduces concentrations of volatile constituents in petroleum products that are adsorbed to soils and dissolved in groundwater. This technology, which is also known as "in situ air stripping" and "in situ volatilization," involves the injection of contaminant-free air into the subsurface saturated zone, enabling a phase transfer of hydrocarbons from a dissolved state to a vapor phase. The air is then vented through the unsaturated zone.

Air sparging is most often used together with soil vapor extraction (SVE), but it can also be used with other remedial technologies. When air sparging (AS) is combined with SVE, the SVE system creates a negative pressure in the unsaturated zone through a series of extraction wells to control the vapor plume migration. This combined system is called AS/SVE.

**Anaerobic:** a technical word which literally means without oxygen.

**Applicable or Relevant and Appropriate Requirements (ARARs):** Cleanup standards promulgated under federal environmental or state environmental and facility siting laws.

**Bioaccumulate:** Substances that when taken into the body through contaminated food, water or air slowly accumulate in body tissues or fat because the substances are slow to breakdown or excreted.

**Biomagnify:** Similar to bioaccumulation with the distinction being that bioaccumulation occurs within a food chain (trophic level) and bio-magnification is the same process across different trophic levels.

**Biodegradation:** is the process whereby organic chemicals are broken down into progressively simpler molecules, largely by the action of various bacteria.

**Bioremediation:** the use of microorganisms to transform or alter, through metabolic or enzymatic action, hazardous organic contaminants into nonhazardous substances.

**Carcinogenic Risk:** Cancer risks are expressed as a number reflecting the increased chance that a person will develop cancer if exposed to chemicals or substances. For example, EPA's acceptable risk range

for Superfund sites is  $1 \times 10^{-4}$  to  $1 \times 10^{-6}$ , meaning there is 1 additional chance in 10,000 ( $1 \times 10^{-4}$ ) to 1 additional chance in 1 million ( $1 \times 10^{-6}$ ) that a person will develop cancer if exposed to a site that is not remediated.

**Chemical of Potential Concern (COPC):** A contaminant found in site-specific media, deemed by the human health assessment estimation calculation rules to be a compound potentially contributing to human health risk. Chemicals are selected to represent site contamination.

**Carcinogenic:** A type of risk resulting from exposure to chemicals that may cause cancer in one or more organs.

**Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (CERCLA), 42 U.S.C. §§ 9601 to 9675:** Commonly referred to as Superfund Law., CERCLA is a federal law which was passed in 1980 and amended in 1986 and again in 2002. CERCLA created a special tax that was placed in a trust fund to investigate and cleanup abandoned or uncontrolled hazardous waste sites that endanger public health and safety or the environment.

**Comment Period:** A time for the public to review and comment on various documents and actions taken. A minimum of a 30-day comment period is held to allow community members to review the Administrative Record file and review and comment on the Proposed Plan.

**Construction Worker (scenario):** The potential exposure scenario involving a future adult construction worker who is assumed to work at the site and who may be involved with any type of excavation activity.

**Contaminant:** Any physical, biological, chemical or radiological substance or matter that, at a high enough concentration, could be harmful to human health or to the environment.

**Contaminant Migration Pathway:** The route that site contaminants may take to get from the source of contamination to a human being, animal, or plant.

**Contaminant plume:** a column of contamination with measurable horizontal and vertical dimensions that is suspended in and moves with ground water.

**Corrective Measures Study:** A corrective measures study (CMS) involves the identification and evaluation of remedial alternatives (i.e., remedies) for performing corrective action at one or more solid waste

## Glossary of Terms(cont.)

management units (SWMUs) at a RCRA facility. It is prepared by the facility owner/operator with guidance or oversight from EPA or an authorized State. If required to perform a CMS, an owner/operator identifies, evaluates and recommends one or more specific remedies that will remediate releases based on a evaluation of applicable data and available corrective measures technologies.

**Ecological Risk Assessment (ERA):** An evaluation of the risk posed to the environment if remedial activities are not performed at the site.

**Environmental Restoration Program (ERP):** The Navy, as the lead agency, acts in partnership with EPA and NYSDEC to address environmental investigations at the facility through the ERP. The current ERP is consistent with CERCLA and applicable state environmental laws.

**Feasibility Study (FS):** Analysis of the practicability of a remedial proposal. The FS usually recommends the selection of a cost-effective alternative.

**Groundwater:** Subsurface water that occurs in soils and geologic formations that are fully saturated.

**Hazard Index (HI):** The sum of chemical-specific Hazard Quotients. A Hazard Index of greater than 1 is associated with an increased level of concern about adverse non-cancer health effects.

**Human Health Risk Assessment (HHRA):** An evaluation of the risk posed to human health should remedial activities not be implemented.

**Information Repository:** A file containing information, technical reports, and reference documents regarding an NPL site. This file is usually maintained at a location with easy public access, such as a public library.

**Land Use Controls (LUCs):** Physical, legal, or administrative methods that restrict the use of or limits access to property to reduce risks to human health and the environment.

**Industrial Worker (scenario):** The potential exposure scenario which is based on the current full-time onsite worker and is an adult who works at the site year round.

**Incremental Lifetime Cancer Risk (ILCR):** The ILCR is a calculation derived as  $ILCR = \text{Exposure } (\mu\text{g}/\text{kg}/\text{d}) \times \text{Cancer Slope Factor } (\mu\text{g}/\text{kg}/\text{day})^{-1}$

Where pathway-specific slope factors or unit risks exist, the risks via inhalation and the risks via oral + dermal exposure should be estimated separately. In other cases, the cancer risks posed by simultaneous inhalation/dermal/oral exposure can be estimated. Cancer risks will be considered "essentially negligible" where the estimated ILCR is 1-in-100,000 ( $\leq 1 \times 10^{-5}$ ) (Health Canada 2004). If the ILCR is greater than  $1 \times 10^{-5}$ , the risk assessment should either be refined and/or risk management measures should be taken.

**In-situ:** can refer to where a clean up or remediation of a polluted site is performed using and simulating the natural processes in the soil, contrary to *ex situ* where contaminated soil is excavated and cleaned elsewhere, off site.

**Land Use Controls:** Non-engineered instruments such as administrative and/or legal controls that minimize potential for human exposure to contamination and protect the integrity of the remedy.

**Maximum Contaminant Level (MCL):** EPA or NYSDOH-published (promulgated as law) maximum concentration level for contaminants found in water in a public water supply system.

**Monitoring:** Ongoing collection of information about the environment that helps gauge the effectiveness of a cleanup action. This includes the collection of samples with laboratory analysis for the contaminants of interest.

**Monitored Natural Attenuation:** is a technique used to monitor or test the progress of natural attenuation processes that can degrade contaminants in soil and groundwater. It may be used with other remediation processes as a finishing option or as the only remediation process if the rate of contaminant degradation is fast enough to protect human health and the environment. Natural processes can then mitigate the remaining amount of pollution; regular monitoring of the soil and groundwater can verify those reductions.

**Noncarcinogenic:** A type of risk resulting from the exposure to chemicals that may cause systemic human health effects.

**National Contingency Plan; National Oil and Hazardous Substance Pollution Contingency Plan (NCP):** The NCP is codified in 40 C.F.R. Part 300. The purpose of the NCP is to provide the organizational structure and procedures for preparing for and responding to discharges of oil and releases of hazardous substances, pollutants or contaminants.

## Glossary of Terms(cont.)

**National Priorities List (NPL):** A list, developed by EPA, of uncontrolled hazardous substance release sites in the United States that are considered priorities for long-term remedial evaluation and response.

**Noncarcinogenic Risk:** Noncancer Hazards (or risk) are expressed as a quotient that compares the existing level of exposure to the acceptable level of exposure. There is a level of exposure (the reference dose) below which it is unlikely for even a sensitive population to experience adverse health effects. EPA's threshold level for noncarcinogenic risk at Superfund sites is 1, meaning that if the exposure exceeds the threshold, there may be a concern for potential noncancer effects.

**New York State Department of Environmental Conservation (NYSDEC):** The state agency responsible for administration and enforcement of environmental regulations.

**Organic Compounds:** These are naturally occurring or man-made chemicals containing carbon. Volatile organics can evaporate more quickly than semivolatile organics. Other organics investigated during RI/FS activities include pesticides and polychlorinated biphenyls (PCBs). Some organic compounds may cause cancer; however, their strength as a cancer-causing agent can vary widely. Other organics may not cause cancer but may be toxic. The concentrations that cause harmful effects can also vary widely.

**Oxygen Release Compound (ORC):** is formulation of phosphate-intercalated magnesium peroxide that, when hydrated, produces a controlled release of oxygen for periods of up to 12 months on a single application.

**Pine Barrens:** is a large area of publicly protected pine in Suffolk County New York, on Long Island, covering more than 100,000 acres (405 km<sup>2</sup>).

It is Long Island's largest natural area and its last remaining wilderness. The region contains a remnant of the Atlantic coastal pine barrens ecoregion, whose forests might once have covered a quarter million acres (1,000 km<sup>2</sup>) on Long Island.

The Central Pine Barrens overlays and recharges a portion of a federally designated sole source aquifer for Long Island's drinking water. All of Long Island's drinking water comes from ground water wells; none of

the island's water comes from reservoirs. Almost all of the Peconic River and Carmans River (two of Long Island's four biggest rivers) as well as much of their watersheds are in the Barrens.

**Polychlorinated Biphenyls (PCBs):** are a class of organic compounds (specifically organochlorides) with 2 to 10 chlorine atoms attached to biphenyl, which is a molecule composed of two benzene rings. PCBs were widely used as dielectric and coolant fluids in transformers, capacitors, and electric motors. Due to PCBs' toxicity and classification as a persistent organic pollutant, PCB production was banned by the United States Congress in 1979 and by the Stockholm Convention on Persistent Organic Pollutants in 2001. Concerns about the toxicity of PCBs are largely based on compounds within this group that share a structural similarity and toxic mode of action with dioxin. Toxic effects such as endocrine disruption and neurotoxicity are also associated with other compounds within the group.

**Present-Worth Cost:** Total cost, in current dollars, of the remedial action. The present-worth cost includes capital costs required to implement the remedial action, as well as the cost of long-term operations, maintenance, and monitoring.

**Proposed Plan (Proposed Plan):** A plan which summarizes the preferred cleanup strategy and rationale. It also reviews the alternative(s) presented in detail in the FS. The Proposed Plan may be prepared either as a fact sheet or a separate document. The preparation of a Proposed Plan is a public participation requirement of CERCLA and the National Contingency Plan.

**Public Comment Period:** The time allowed for the members of an affected community to express views and concerns regarding an action proposed to be taken by the Navy and EPA, such as a rulemaking, permit, or Superfund-remedy selection.

**Public Repository:** A file containing information, technical reports and reference documents developed for a site undergoing cleanup. This file is usually maintained in a place with convenient public access, such as a public library

**Record of Decision (ROD):** An official public document that explains which cleanup alternatives was selected. The ROD is based on information and technical analysis generated during the RI/FS process and considers public comments and community concerns raised upon the issuance of the Proposed Plan. The ROD explains the remedy selection process

## Glossary of Terms(cont.)

and is issued following the conclusion of the public comment period.

**Remedial Action:** The actual construction or implementation phase that follows the remedial design for the selected cleanup alternative at a site.

**Remedial Action Objective (RAO):** An objective selected in the FS, against which all potential remedial actions are judged.

**Remedial Design:** is the phase in Superfund site cleanup where the technical specifications for cleanup remedies and technologies are designed. Remedial Action (RA) follows the remedial design phase and involves the actual construction or implementation phase of Superfund site cleanup. The RD/RA is based on the specifications in the record of decision (ROD).

**Remedial Investigation/Feasibility Study (RI/FS):** Investigation and analytical studies usually performed at the same time in an interactive process and together referred to as the "RI/FS." They are intended to gather data needed to determine the type and extent of contamination, establish criteria for cleaning up the site, identify and screen cleanup alternatives for remedial action and analyze in detail the technology and cost of the alternatives

**Resident (scenario):** The potential exposure scenario which is based on a future resident and a person who will live in a residence located at or near the site in a hypothetical future scenario. This receptor occupies a residence as a child (from age 0 - 6 years) and as an adult (for 24 years exposure duration). This receptor is potentially exposed to COPCs in groundwater via tap water ingestion, dermal contact while bathing, and inhalation of VOCs present in vapors generated during showering (adult resident only). In addition, the future resident is potentially exposed via incidental ingestion of, dermal contact with, and particulate dust inhalation of COPCs in surface soil. Inhalation of VOCs from vapor emissions from soil is not considered a significant pathway of exposure because VOCs were detected infrequently and at low concentrations in soil at the WOD. Non-cancer risks were estimated separately for child versus adult, whereas, cancer risks were considered cumulative (risks were summed over child and adult periods of exposure). Additionally, potential exposure to disturbed soil that is a mixture of surface and subsurface soils as a result of construction or landscaping activities was addressed.

**Resource Conservation and Recovery Act, as amended, (RCRA), 42 U.S.C. §§ 6901-6939(e):** A federal law which ensures 1) the proper management of hazardous waste from the point of generation until final disposal and 2) that an owner and operator of a hazardous waste treatment, storage and disposal facility investigates and cleans up and releases necessary to protect human health and the environment.

**Responsiveness Summary:** A summary of oral and written public comments received during a comment period following issuance of the Proposed Plan and the responses to these. The responsiveness summary is an important part of the ROD, highlighting community concerns for decision makers.

**Reasonable Maximum Exposure (RME):** The highest exposure that is reasonably expected to occur at a site. The RME estimates include both "high end" exposure factors (> 90<sup>th</sup> percentile) with average factors to develop an RME estimate of cancer risks and non-cancer HIs.

**Risk Assessment:** This process evaluates and estimates the current and future potential for adverse human health or environmental effects resulting from exposure to contaminants.

**Safe Drinking Water Act: 42 U.S.C. §§ 300f to 300j-26:** A federal law which governs the treatment and distribution of public drinking water.

**Site Inspection (SI):** Sampling investigation with the goal of identifying potential sources of contamination, types of contaminants, and potential migration of contaminants. The SI is conducted prior to the RI.

**Source Area:** The zone of highest soil or groundwater concentrations, or both, of the chemicals of concern. The area considered to be the point of release.



**Mark Your Calendar for the Public Comment Period**

**Public Comment Period**

October 27-December 12, 2011

**Submit Written Comments**

The Navy will accept written comments on the Proposed Plan during the public comment period.



**Attend the Public Meeting  
Thursday November 3, 2011**

**5:30 pm**

**Calverton Community Center  
Grumman Blvd  
Calverton, New York**

The Navy will hold a public meeting to explain the Proposed Plan and remedial actions conducted at the Site to date. Verbal and written comments will also be accepted at this meeting.



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Place  
stamp  
here

**Public Affairs Officer**  
Code 09PA  
Naval Facilities Engineering  
Command,  
Mid-Atlantic  
9742 Maryland Ave, Bldg. A81  
Norfolk, Virginia 23511