



Proposed Plan

Solvent Release Area (SRA) – Operable Unit 14

Former Naval Air Station South Weymouth

Weymouth, Massachusetts

The Proposed Plan

This Proposed Plan was prepared in accordance with federal law to present the Navy's proposed cleanup approach for the Solvent Release Area (SRA) Site, at the former Naval Air Station (NAS) South Weymouth in Weymouth, Massachusetts. **The Navy's proposed remedy for the SRA Site is overburden and bedrock source zone enhanced bioremediation, two overburden permeable reactive barriers, monitoring, engineering controls, and land use controls.** This document summarizes the proposed remedy and describes how to become involved in the decision-making process.

Introduction

This Proposed Plan provides information to the public on the proposed cleanup approach for the SRA Site at the former NAS South Weymouth (the Base), located in Weymouth, Massachusetts. This plan has been prepared to inform the community of the Navy's basis for the preferred cleanup approach for the Site, and encourage community participation in the decision-making process.

The Navy prepared this Proposed Plan for the SRA Site based upon a thorough evaluation conducted in accordance with the federal Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). This law, better known as Superfund, establishes procedures for investigating and cleaning up hazardous waste sites. Key terms, such as CERCLA, are defined in the Glossary of Terms at the end of the document.

The Navy (as the lead agency) works closely with the U.S. Environmental Protection Agency (USEPA) and the Massachusetts Department of Environmental Protection (MassDEP) in performing environmental investigations, remedial actions, and related activities at the Base in order to return the property to the local communities for reuse and redevelopment.

Let us know what you think!

Mark Your Calendar!

PUBLIC COMMENT PERIOD

February 21, 2013 to March 23, 2013

The Navy will accept written comments on the Proposed Plan for the SRA Site during this period. Send written comments postmarked no later than March 23, 2013 to:

Mr. Brian Helland
Remedial Project Manager
BRAC PMO, Northeast
4911 South Broad Street
Philadelphia, PA 19112



or email your comments to: brian.helland@navy.mil

PUBLIC MEETING AND PUBLIC HEARING – February 27, 2013

The Navy will hold a public meeting at 7:00 p.m. that will include posters and a Navy presentation describing the Proposed Plan. Following the presentation, the Navy will host a question-and-answer session. The Navy will then hold a formal public hearing from 8:00 p.m. until all comments are heard. At the formal hearing, an official transcript of comments will be entered into the record. The above activities will be held at the New England Wildlife Center, 500 Columbian Street, South Weymouth, Massachusetts (phone: 781-682-4878).

For more information, visit one of the Information Repositories listed at the end of this Proposed Plan.

The Navy prepared this Proposed Plan in accordance with CERCLA Section 117(a) and Section 300.430(f)(2) of the National Contingency Plan (NCP) to fulfill its public participation responsibilities. This plan and associated community involvement fulfill the Navy's public participation responsibilities under these laws. The purpose of this Proposed Plan is to:

- Provide background information about the environmental investigations completed at the Site;
- Identify and explain the Navy's preferred cleanup plan for the Site;
- Describe other cleanup options that were considered;
- Encourage public review and comment on this Proposed Plan; and
- Provide information on how the public can be involved in the decision-making process.

Once the public has had the opportunity to review and comment on this Proposed Plan, the Navy will summarize and respond to comments received during the comment period and public hearing in a document called a Responsiveness Summary. The Navy, USEPA, and MassDEP will carefully consider all comments received; based on the comments the Navy could modify the cleanup plan or even select a different plan from that proposed. Ultimately, the selected cleanup plan for the Site will be documented in a Record of Decision (ROD). The Responsiveness Summary will be issued with the ROD.

This Proposed Plan summarizes key information from previous reports concerning the SRA Site. More detailed information can be found in the reports referenced in this Proposed Plan. The reports are available for review at the Information Repositories established for the Base (locations listed at the end of this document).

The Navy encourages the public to review the referenced reports to gain a better understanding of environmental activities completed for the SRA Site.

Scope and Role of the Response Action

The SRA Site is one of the sites identified at the former NAS South Weymouth for cleanup under CERCLA. Each site undergoing cleanup under CERCLA progresses through the cleanup process independently of the other. The response action for the SRA Site is not expected to affect the strategy or progress of environmental investigations at other sites at the Base. As these sites advance through the cleanup process, separate Proposed Plans will be issued accordingly.

The CERCLA Process and the SRA Site

The SRA Site is one of several CERCLA Operable Units (OUs) located at the former NAS South Weymouth (see Figure 1). Each step in the CERCLA process was completed by the Navy with input from the USEPA and MassDEP.

The undeveloped parcel of land that constitutes the Site was originally selected for background sampling in 1998 as part the Phase II Environmental Baseline Survey (EBS). Samples from a soil boring in this area contained elevated concentrations of volatile organic compounds (VOCs), arsenic, vanadium, iron, and manganese. Additional soil and groundwater sampling activities were performed in the area from 2002 to 2004. Based on review of these data the Site was moved into the Installation Restoration (IR) Program and designated as IR Site 11, also referred to as OU 14.

The 8-acre SRA Site includes the groundwater underlying the former Pistol Range, an approximately 2-acre area in the southeastern portion of the Site. The No Further Action (NFA) decision documented in the December 2004 ROD for the Pistol Range was based on the Navy's successful completion of two removal actions. The ROD stated that the groundwater would be addressed as part of the SRA Site.

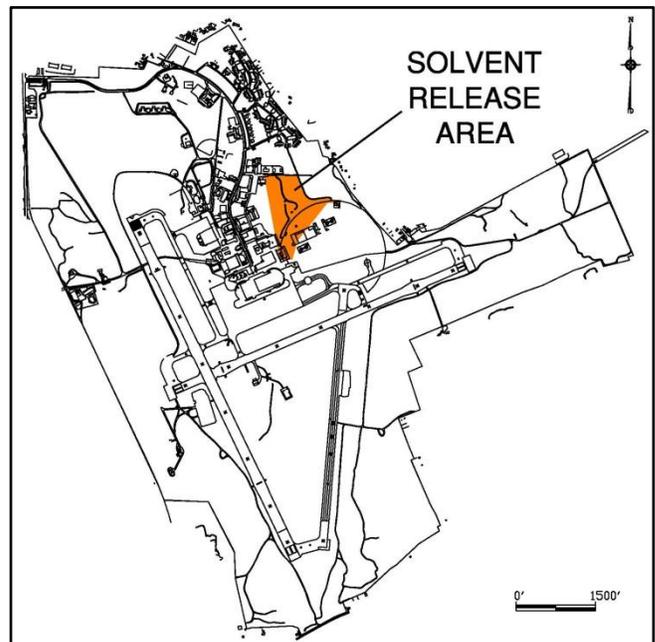


Figure 1 - SRA Site Location

The Navy has conducted numerous investigations at the Site leading to the Remedial Investigation (RI) conducted in 2006 to 2007 and the supplemental RI conducted in 2009. The August 2010 RI Report included the results of the RIs and the previous environmental investigations. The RI also included a human health risk assessment (HHRA) and ecological risk assessment (ERA) to determine if contaminants at the Site posed a threat to human health or ecological receptors (i.e., plants, invertebrates, wildlife). A Feasibility Study (FS), prepared to evaluate potential cleanup alternatives, was completed in December 2012.

Information about the SRA Site is provided below. Documents referenced in this Proposed Plan are available at the Information Repositories listed at the end of this document.

Site Background

Where is the SRA Site?

The SRA Site is located just north of the East Mat in the eastern portion of the Base (Figure 1). The site boundaries are defined by Pidgeon Road to the north, the Eastern Drainage Ditch to the east, approximately 200 feet south of the East Mat Ditch (EMD) to the south/southeast, and approximately 100 feet west of the road leading to the former Pistol Range to the west (see Figure 2 on page 11).

What was the Site used for?

Approximately 2 acres of the Site immediately north of the EMD were used as a Pistol Range until 1983. The former Pistol Range was then used for recreation until the early 1990s. The balance of the Site north of the EMD is undeveloped and includes 4 acres of delineated forested wetlands. Approximately 3 acres of the Site south of the EMD lies within the East Mat. The primary use of the East Mat was as a mooring area for lighter-than-air aircraft, aircraft de-arming area, and as a taxiway and parking area for aircraft. The EMD provided drainage from the East Mat and the surrounding areas. The activities that led to contamination of environmental media at the Site are not known.

Site Characteristics

What does Site look like today?

The Site remains undeveloped and covered with wooded areas and predominantly red maple wetlands north of the EMD. Depth to groundwater across the Site ranges from 0 to 6 feet below ground surface.



Figure 3 – View of the SRA Site Facing South (toward the East Mat)

The former pistol range is now an open field accessed by a dirt road off Pidgeon Road (Figure 3). The East Mat is paved with asphalt; however large sections are cracked and severely weathered. The EMD varies in width from 5 feet to 20 feet and in depth from 3 inches to 16 inches (Figure 4).

What were the investigation results?

Several investigations have been conducted at the SRA Site, including soil characterization, multiple groundwater sampling programs, a shallow soil sampling program, the RI, and supplemental RI. See the Environmental Investigations text box on page 4 for details on the various investigations.



Figure 4 – View of the EMD Facing East

Samples collected from the SRA Site during past investigations included surface soil, subsurface soil, and groundwater. Surface water and sediment samples were also collected from the EMD and the Eastern Drainage Ditch. The samples were analyzed for a wide range of chemicals since the source of contamination was not known. The following summarizes the findings of the RI and supplemental RI:

Volatile Organic Compounds (VOCs) - VOCs, primarily tetrachloroethene (PCE) and its degradation products (trichloroethene [TCE], cis-1,2-dichloroethene [cis-1,2-DCE], and vinyl chloride) were detected in all environmental media at the Site. VOCs were detected with the greatest frequency in groundwater and generally detected infrequently in soils, surface water, and sediment. The highest VOC concentrations were detected in groundwater in the northern portion of the Site.

Semi-volatile Organic Compounds (SVOCs) - SVOCs were detected in all media. Concentrations of three SVOCs exceeded the USEPA screening criteria in groundwater. Concentrations of five SVOCs in soils and five SVOCs in sediment exceeded the USEPA screening criteria.

Pesticides - Pesticides were not detected in surface water. Pesticides were detected in site soil, groundwater, and sediment, generally infrequently and at low concentrations.

Polychlorinated Biphenyls (PCBs) - PCBs were not detected in groundwater. PCBs were detected infrequently in surface and subsurface soil (Aroclor-1242 and Aroclor-1260) and surface water (Aroclor-1248) samples. Aroclor-1260 was detected in the majority of the sediment samples. Aroclor-1242, Aroclor-1248, and Aroclor-1252 were each detected in one sediment sample.

Inorganics - Several inorganics (metals) were detected at the Site. Five metals (aluminum, arsenic, iron, manganese, and vanadium) were present at concentrations exceeding the USEPA screening criteria in soil, groundwater, surface water, and sediment. Concentrations of barium in groundwater also exceeded the USEPA screening criteria.

Figure 2 on page 11 shows the Site boundary based on the findings of the RI. The boundary indicates the extent of chlorinated VOC (CVOC) contamination in overburden and bedrock groundwater. The site overburden is 10 to 30 feet of unconsolidated materials underlain by bedrock.

Environmental Investigations

1983: The Navy began evaluating environmental impacts at former NAS South Weymouth, including site walkovers, reviews of Base records, and interviews.

1994: USEPA listed former NAS South Weymouth on the National Priorities List.

1995: The Navy performed a Phase I EBS. The Pistol Range was one of the sites identified for further study.

1998: The Navy conducted a Phase II EBS. A soil boring location was advanced in the area now known as the Site. VOCs (namely PCE) were detected in the soil at this location.

2002: Additional soil samples were collected. PCE and cis-1,2-DCE were detected.

2003: A groundwater sample was collected downgradient of the soil boring locations to determine if chlorinated VOCs (CVOCs) were present in groundwater. PCE, TCE, and cis-1,2-DCE were detected in the groundwater sample. Temporary wells were installed. CVOCs were detected at several locations.

2004: CVOCs were detected in overburden and shallow bedrock monitoring wells installed to evaluate the extent of VOCs in groundwater. Shallow soil samples were collected and a geophysical survey conducted to determine the source of VOC contamination. Surface metal and debris were identified and removed but no VOC source was identified.

2006 – 2011: The Navy performed a comprehensive RI, including supplemental groundwater investigations, to evaluate the nature and extent of contamination in site surface water, soil, sediment, and groundwater. The RI also included a HHRA and an ERA to determine risks posed by the Site.

Summary of Site Risks

The samples collected and evaluated during implementation of the RI were used in risk assessments to determine if site contaminant concentrations pose a threat to human health and the

environment. The results of these assessments are described below.

Human Health Risks

The Navy conducted an HHRA to determine whether detected concentrations of chemicals at the SRA Site pose an unacceptable risk to human health. The 4-step process described below was used to estimate the baseline risk for human health.

Step 1 - Hazard Identification. Chemicals of potential concern (COPCs) were identified as those analytes with concentrations that exceeded benchmark screening levels (USEPA Regional Screening Levels [RSLs]) and background levels, if applicable. COPCs were used for site-specific risk calculations (i.e., Steps 2 through 4 described below).

Step 2 - Exposure Assessment. This process examines possible pathways by which humans may contact the COPCs based on current and future use scenarios.

Under current use scenarios potential risks to adolescent trespassers were evaluated. Potential exposure pathways included touching and incidental ingestion of surface water, sediment, and surface soil, and inhalation of chemicals volatilized from groundwater into outdoor air.

Under future use scenarios potential risks were evaluated for adolescent trespassers, child and adult recreational users, on-site maintenance workers, construction workers, and child and adult residents. Potential exposure pathways included touching, inhalation, or incidental ingestion of groundwater, soil, sediment, and surface water, and inhalation of chemicals volatilized from groundwater into indoor and outdoor air.

Step 3 - Toxicity Assessment. The possible harmful effects to humans from the COPCs were evaluated. These chemicals were separated into two groups: carcinogens (COPCs that may cause cancer) and non-carcinogens (COPCs that may cause adverse health effects other than cancer).

Step 4 - Risk Characterization. Lastly, the results from the exposure and toxicity assessment were combined to calculate the overall risks from exposure to site COPCs. The HHRA did not identify any unacceptable human health risks under current exposure scenarios. The HHRA identified potential future cancer and non-cancer risks exceeding the acceptable EPA risk levels described in the text box on this page.

Conclusions - Potential unacceptable risks were identified for future residents from use of groundwater as a source of drinking water and from vapor intrusion into buildings, and to future construction workers exposed to vapors in trenches.

The following were identified as chemicals of concern (COCs) because their concentrations cause the highest levels of risk in groundwater: PCE, TCE, cis-1,2-DCE, vinyl chloride, 3,3'-dichlorobenzidine, pentachlorophenol (PCP), arsenic, and barium in groundwater; PCE in trench air; and PCE in vapor intrusion into buildings. While not identified as a medium of concern in the RI, surface water is considered a medium of concern in the FS due to potential future impacts from contaminated groundwater discharging to surface water in the EMD. COCs associated with recreational exposure to surface water in the EMD include PCE, TCE, cis-1,2-DCE, vinyl chloride, and Aroclor-1248.

How Are the Risks Expressed?

It depends on the type of chemical. For potential carcinogens, the risk to human health is expressed in terms of the probability of the chemical causing cancer over an estimated lifetime of 70 years. USEPA's acceptable risk range for carcinogens is from 1 in 1 million to 1 in 10,000.

In general, calculated risks that are greater than 1 in 10,000 would require consideration of cleanup alternatives. For non-carcinogens, the risk to human health is expressed as a Hazard Index. A Hazard Index greater than 1 suggests that adverse health effects are possible.

Ecological Risks

The ERA included the following three steps:

Step 1 - Problem Formulation. The Navy collected and evaluated information about the site conditions (e.g., type of habitat, and types of plant and animal species present), the COPCs, and the potential exposure pathways. The ERA evaluated the following receptor groups: terrestrial plants; terrestrial wildlife; terrestrial invertebrates; aquatic receptors; and wetlands wildlife. Animal receptor groups included local types of small mammals, birds, reptiles, amphibians, fish, and insects.

A screening evaluation selected as COPCs chemicals with concentrations which exceeded media-specific screening values or which did not have screening

values. The COPCs in soil, surface water, and sediment included VOCs, SVOCs, pesticides, PCBs, and inorganics.

Step 2 - Risk Analysis. Similar to the HHRA, the Navy evaluated the possible harmful effects to the ecological receptors from exposure to the COPCs.

The chemical concentrations to which the ecological receptors might be exposed were determined by sampling soil, surface water, and sediment. The sample concentrations were used directly to determine risk to plants and invertebrates. Potential exposure for terrestrial and wetland vertebrates was determined in food chain models based on the sampling data; estimates of COPC exposure via ingestion of plant and animal tissue were also included. Exposure estimates for wildlife were compared to literature toxicity values for birds or mammals to calculate a hazard quotient (HQ). An HQ greater than 1 indicates potential unacceptable risk.

Step 3 - Risk Characterization. The results from the risk analysis were used to determine the probability of adverse effects to the ecological receptors at the Site.

Conclusions - The detailed risk evaluation determined that plants or invertebrates are not likely to be significantly impacted from the chemicals detected in site soil. Risks to aquatic organisms were not great enough for any chemicals to warrant further evaluation and/or the concentrations in the Site samples were similar to the concentrations in background samples.

Although some slight impacts to sediment invertebrates could occur from polycyclic aromatic hydrocarbons (PAHs) and pesticides in the sediment, the PAHs and pesticides do not appear to be site-related. Some slight impacts to sediment invertebrates could occur from PCBs in the sediment. None of the metals detected in the sediment samples are expected to significantly impact sediment invertebrates at the Site.

Risks to wildlife were not great enough for any contaminants to warrant further evaluation at the Site. The ERA concluded that further evaluation of ecological risk was not warranted.

Additional Risk Considerations

There are no medium or high-yield aquifers mapped at the Site; site groundwater is not considered a drinking water source. Future use of site groundwater for production, supply, or irrigation are not reasonably foreseeable uses and were not exposure scenarios evaluated in the FS. Vapor intrusion pathways are

limited since the delineated wetlands limit areas suitable for development.

Future uses of the former NAS South Weymouth property have been set by the Zoning and Land Use By-Laws and the Reuse Plan approved in 2005. The SRA property north of the EMD is zoned as open space; the property south of the EMD is zoned as recreation district (see Figure 2 on page 11). Allowable uses in these two zoning districts include public and outdoor commercial recreation; indoor commercial recreation is also allowed on the East Mat. Residential use is not allowed in either zoning district.

It is the Navy's current judgment that the Preferred Alternative identified in this Proposed Plan, or one of the other alternatives considered, is necessary to protect public health or welfare or the environment from actual or threatened releases of pollutants or contaminants from this Site which may present an imminent and substantial endangerment to public health or welfare.

Remedial Action Objectives

Remedial action objectives (RAOs) are the goals that a cleanup plan should achieve. They are established to protect human health and the environment, and comply with all pertinent federal and state regulations. Based on the risk assessments an FS was required to address the identified human health risks. The media of concern include groundwater and vapor intrusion from volatilization of chemicals from groundwater. Surface water in the EMD is also considered a medium of concern due to potential impacts from discharge of contaminated groundwater to the EMD.

The following RAOs were identified for the SRA:

1. Prevent the migration of COCs to surface water at concentrations that pose an unacceptable risk to human health.
2. Prevent exposure of building occupants to VOCs resulting from vapor intrusion into future buildings at the Site at concentrations that pose unacceptable risk.
3. Prevent exposure of construction workers during excavation activities to VOCs and COCs in groundwater at concentrations that pose unacceptable risk.
4. Prevent migration of groundwater containing COCs at concentrations that pose unacceptable risk.

Preliminary Remediation Goals

Cleanup goals (also known as preliminary remediation goals [PRGs]) for the groundwater COCs were developed in the FS. The human health risk-based PRGs were based on calculations of acceptable risk levels, regulatory criteria, and background concentrations. The PRGs selected for site groundwater in the open space and recreation zoning districts are shown below; and are the lowest of the vapor intrusion and construction worker PRGs calculated for the Site. The table below also shows PRGs calculated for surface water in the EMD.

COC	PRGs (µg/L)	
	Groundwater	Surface Water
PCE	370	860
TCE	18	220
cis-1,2-DCE	4,400	1,000
Vinyl Chloride	39*	130
PCP	200	NA
3,3'-DCB	1,200	NA
Arsenic	900	NA
Barium	50,000	NA
Aroclor-1248	NA	140

*Recreation zone value; open space zone PRG = 52 µg/L.
NA- Not applicable

Summary of Remedial Alternatives

Remedial alternatives, or cleanup options, were identified for the SRA Site in the FS. The alternatives identified were selected because they would meet the RAOs listed above. Table 1 on page 12 summarizes the durations and estimated costs of each alternative. Each alternative is described below.

Alternative G-1: No Action

A “no action” alternative would leave the Site as it is today. Although the Navy has not considered this to be an appropriate response action for the SRA, it is statutory requirement under CERCLA as a baseline for comparison with other alternatives.

Alternative G-2: Monitoring, Engineering Controls, and Land Use Controls (LUCs)

Under this alternative site groundwater, surface water, and sediment would be monitored to ensure that groundwater contaminants do not migrate and impact the EMD. Groundwater monitoring data would be used to ensure the boundaries and types of LUCs are appropriate. Groundwater and surface water samples would be analyzed for PCE, TCE, cis-1,2-DCE, vinyl chloride, iron, manganese, and arsenic. Select

groundwater monitoring wells would also be analyzed for PCP, 3,3-dichlorobenzidine, and barium.

Sediment samples would be analyzed for iron, arsenic, and manganese. Specific sampling locations would be identified in the long-term monitoring plan to be developed during the remedial design (RD) phase for the selected remedy. Samples would be collected quarterly for the first year, semi-annually for the following two years, and annually thereafter.

A fence would be constructed around a portion of the EMD to prevent human receptors from contacting surface water in the EMD. The fence would remain in place until the surface water PRGs are met, groundwater PRGs are met at the monitoring wells installed upgradient of the EMD (i.e. groundwater concentrations would not cause the surface water PRGs to be exceeded), and the remedy is operating properly and successfully.

LUCs would be implemented to control exposure to COCs in groundwater until the PRGs are achieved. A permanent LUC would be implemented to prohibit installation of groundwater production, supply, or irrigation wells at the SRA Site. The interim LUCs listed below would be established north of the EMD:

- A LUC requiring prior USEPA and MassDEP approval of construction dewatering plans before excavation activities could be conducted, until PRGs are met.
- A LUC specifying health and safety procedures to be used by construction workers to prevent unacceptable exposure risks until PRGs are met.

The LUCs would be implemented through a LUC RD as part of the RD phase for the selected remedy. The LUC RD would describe the specific controls for the Site, as well as the implementation protocols and upkeep requirements.

Annual inspections would be conducted to confirm compliance with the LUC objectives; an annual compliance certificate would be prepared and provided to USEPA and MassDEP. USEPA and MassDEP would be notified prior to any property conveyance.

Five-year reviews, including a site inspection, would be conducted within 5 years of initiation of the remedial action to ensure that the remedy continues to be protective of human health and the environment. Five-year reviews would continue to be performed as long as contaminants are present at concentrations that prevent unrestricted site use.

Alternative G-3: One Overburden Permeable Reactive Barrier (PRB), Monitoring, Engineering Controls, and LUCs

This alternative includes installation of one overburden mulch PRB north of and near the EMD to intercept and treat the overburden PCE plume at its leading edge. A mulch PRB provides an organic source for microorganisms, which stimulates anaerobic degradation of the CVOCs. The mulch PRB would need to be replenished with a non-petroleum oil-based electron donor (ED) (such as vegetable oil) after the organic material in the mulch is exhausted. A pilot treatability study would be performed prior to design to determine the construction details for the PRB. The PRB would be maintained as long as groundwater concentrations would cause the surface water PRGs to be exceeded.

The monitoring component would be similar to Alternative G-2. The reducing conditions caused by the mulch barriers may mobilize iron, manganese, and arsenic from the soil to the groundwater. As part of the long term monitoring program, groundwater samples downgradient of the PRB and surface water samples from the EMD would be analyzed for iron, manganese, and arsenic. If concentrations of these metals exceed target levels and cause unacceptable risks or conditions in the EMD (to be determined during the preparation of the long-term monitoring plan), then a contingency measure would be implemented to change the reducing conditions to oxidizing conditions in the area between the PRB and EMD.

The engineering controls and LUCs would be identical to those proposed for Alternative G-2. Construction of the PRB near the EMD would allow for removal of the engineering controls after the upgradient portion of the overburden PCE plume meets the PRGs. Five-year reviews would be performed as long as contaminants are present at concentrations that prevent unrestricted site use.

Alternative G-4: Two Overburden PRBs, Monitoring, Engineering Controls, and LUCs

This alternative is similar to Alternative G-3 but includes installation of two mulch PRBs. A second PRB would be installed further north of the EMD at the upgradient edge of the upland to treat the PCE plume entering the upland area. A pilot treatability study would be performed prior to design to determine the details of the construction of the PRBs. The PRBs would be maintained as long as groundwater concentrations would cause the surface water PRGs and the vapor intrusion PRGs to be exceeded.

The monitoring component would be similar to Alternative G-3. The engineering controls and LUCs would be identical to those proposed for Alternative G-2. Construction of the PRB near the EMD would allow for removal of the engineering controls after the upgradient portion of the overburden PCE plume is cleaned up. Construction of the PRB at the upland edge would allow for removal of vapor intrusion LUCs in the upland area when the overburden PCE plume upgradient of the upland area meets the PRGs. Five-year reviews would be performed as long as contaminants are present at concentrations that prevent unrestricted site use.

Alternative G-5: Overburden and Bedrock Source Zone Enhanced Bioremediation, One Overburden PRB, Engineering Controls, and LUCs

This alternative involves active treatment by in-situ enhanced bioremediation in two target treatment zones (TTZs) to reduce the source mass of the PCE plumes. The TTZs are the source areas with the highest groundwater concentrations in the overburden and bedrock. A soluble ED, sodium lactate, would be injected in both the overburden and bedrock TTZs through grids of injection points. Because the source area treatment would impact wetlands, the impacted areas would need to be mitigated after injection well installation is completed.

The overburden PRB component would be identical to Alternative G-3. Prior to the design of the enhanced bioremediation system, a pilot treatability study would be performed to determine chemical injection rates, buffering requirements, injection well spacing, and details of the construction of the PRB.

The monitoring component would be similar to Alternative G-4, but would include monitoring wells in the TTZs. The engineering controls and LUCs would be identical to those proposed for Alternative G-2. Construction of the PRB near the EMD would allow for removal of the engineering controls after the upgradient portion of the overburden PCE plume meets the PRGs. Five-year reviews would be performed as long as contaminants are present at concentrations that prevent unrestricted site use.

Alternative G-5A: Overburden and Bedrock Source Zone Enhanced Bioremediation, Two Overburden PRBs, Engineering Controls, and LUCs

This alternative involves active treatment by in-situ enhanced bioremediation in two TTZs as described for Alternative G-5. The two overburden mulch PRBs component of this alternative would be identical to Alternative G-4. Prior to the design of the enhanced bioremediation system, a pilot treatability study would

be performed to determine chemical injection rates, buffering requirements, injection well spacing, and details of the construction of the PRBs.

Monitoring would be nearly identical to Alternative G-4 and would also include monitoring wells in the TTZs, as described for Alternative G-5. The engineering controls and LUCs would be identical to those proposed for Alternative G-2. Construction of the PRB near the EMD would allow for removal of the engineering controls after the upgradient portion of the overburden PCE plume meets the PRGs. Construction of the PRB at the upland edge would allow for removal of vapor intrusion LUCs in the upland area when the overburden PCE plume upgradient of this area is cleaned up. Five-year reviews would be performed as long as contaminants are present at concentrations that prevent unrestricted site use.

Evaluation of Alternatives

USEPA has established nine criteria for use in comparing the advantages/disadvantages of each remedial alternative. These criteria fall into three groups: threshold criteria that any selected alternative must meet; primary balancing criteria that are used to differentiate between alternatives; and modifying criteria that may be used to modify the recommended remedy. Each remedial alternative is individually evaluated in the FS with respect to seven of the nine criteria and then compared against each other with respect to each criterion. The two modifying criteria are evaluated after receipt of state and public comments on the Proposed Plan.

Table 1 on page 12 provides a general description of the nine evaluation criteria and presents a summary of the evaluation of the alternatives for the SRA Site.

Preferred Alternative

In summary, the Navy is proposing Alternative G-5A, overburden and bedrock source zone enhanced bioremediation, two overburden PRBs, monitoring, engineering controls, and LUCs. This alternative is recommended because it will achieve substantial risk reduction by both treating the source materials constituting principal threats at the Site and providing safe management of the remaining material. Alternative G-5A will also meet the RAOs and PRGs.

Overall, this alternative will include the following elements:

- Reduction of contaminant concentrations in the source area and throughout the plume area

through enhanced bioremediation in overburden and bedrock groundwater.

- Reduction of contaminant concentrations through installation of two overburden PRBs to intercept and treat the overburden PCE plume.
- Monitoring, including collection of groundwater, surface water, and sediment samples to evaluate the progress of remediation.
- Implementation of permanent LUCs to prohibit installation of groundwater production, supply or irrigation wells at the SRA Site.
- Implementation of interim LUCs north of the EMD to prevent unacceptable risk from exposure to contaminants in groundwater, vapors, and surface water until the PRGs are achieved.
- Completion of annual site inspections to confirm compliance with the LUC objectives.
- Maintenance of the LUCs for as long as they are needed to prevent unacceptable exposure to contaminated groundwater, surface water, sediment, and indoor air.
- Completion of five-year reviews as long as COCs are present at concentrations that prevent unrestricted site use.

Based on information currently available, the Navy 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 Applicable or Relevant and Appropriate Requirements (ARARs); (3) be cost-effective; (4) utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and (5) satisfy the preference for treatment as a principal element, to the extent practicable.

Next Steps

Community review and comment on this Proposed Plan is the next step in the CERCLA process for the SRA Site. The Navy encourages the public to review this plan and submit comments. The Navy will accept written comments on the Proposed Plan during the public comment period from February 21, 2013 to

March 23, 2013. The Navy will accept oral comments during a Public Hearing that will follow a Public Meeting to be held on February 27, 2013 at the New England Wildlife Center, Weymouth, MA.

Once the communities have commented on this Proposed Plan, the Navy and USEPA will consider all formal comments received. The Navy's proposed remedial alternative could change based on community comments. The Navy will provide written responses to all formal comments received on the Proposed Plan. The responses will be provided in the Responsiveness Summary which is included in the ROD for the Site.

The Navy and USEPA anticipate that all comments will be reviewed and the ROD will be signed by July 2013. The document will then be made available to the public at the Information Repositories listed at the end of this document. The Navy will also announce the availability of the ROD through the local news media and the community mailing list.

Your Questions and Comments are Important!

Formal comments are used to improve the decision-making process. The Navy will accept written comments from the public during the 30-day comment period and will hold a public meeting and hearing to receive oral comments (see page 1 regarding how to submit formal comments to the Navy).

Your formal comments during this time will become part of the official record for the SRA Site. The Navy will consider the comments received during the comment period before making the final decision for the Site. The public is encouraged to participate during this period. You do not have to be a technical expert to take part in the process.

After the ROD is signed, the Navy will design and implement the selected remedy. After the design is completed, the Navy will oversee construction and implementation of the selected alternative.

Commitment to the Communities

The Navy is committed to keeping the communities informed on the environmental cleanup program at former NAS South Weymouth. A Restoration Advisory Board (RAB) comprised of community leaders, government agency representatives, and local citizens, meets regularly to discuss the environmental program at former NAS South Weymouth. At these meetings, you can learn about and offer suggestions for the Navy's cleanup program activities. Upcoming RAB meetings are publicized on local town websites and are open to the public. Past meeting minutes are available on the former NAS South Weymouth website:

<http://www.bracpmo.navy.mil>.

The Navy also maintains a community mailing list for distributing information about the environmental cleanup program. If you would like to be added to the mailing list, please contact Mr. Brian Helland at the address or email provided on the first page of this Proposed Plan.

The information summarized in this Proposed Plan is available for review at the information repositories listed at the end of this document.

Important Dates

Public Comment Period
February 21, 2013 to March 23, 2013

Public Information Session and Public Hearing
February 27, 2013

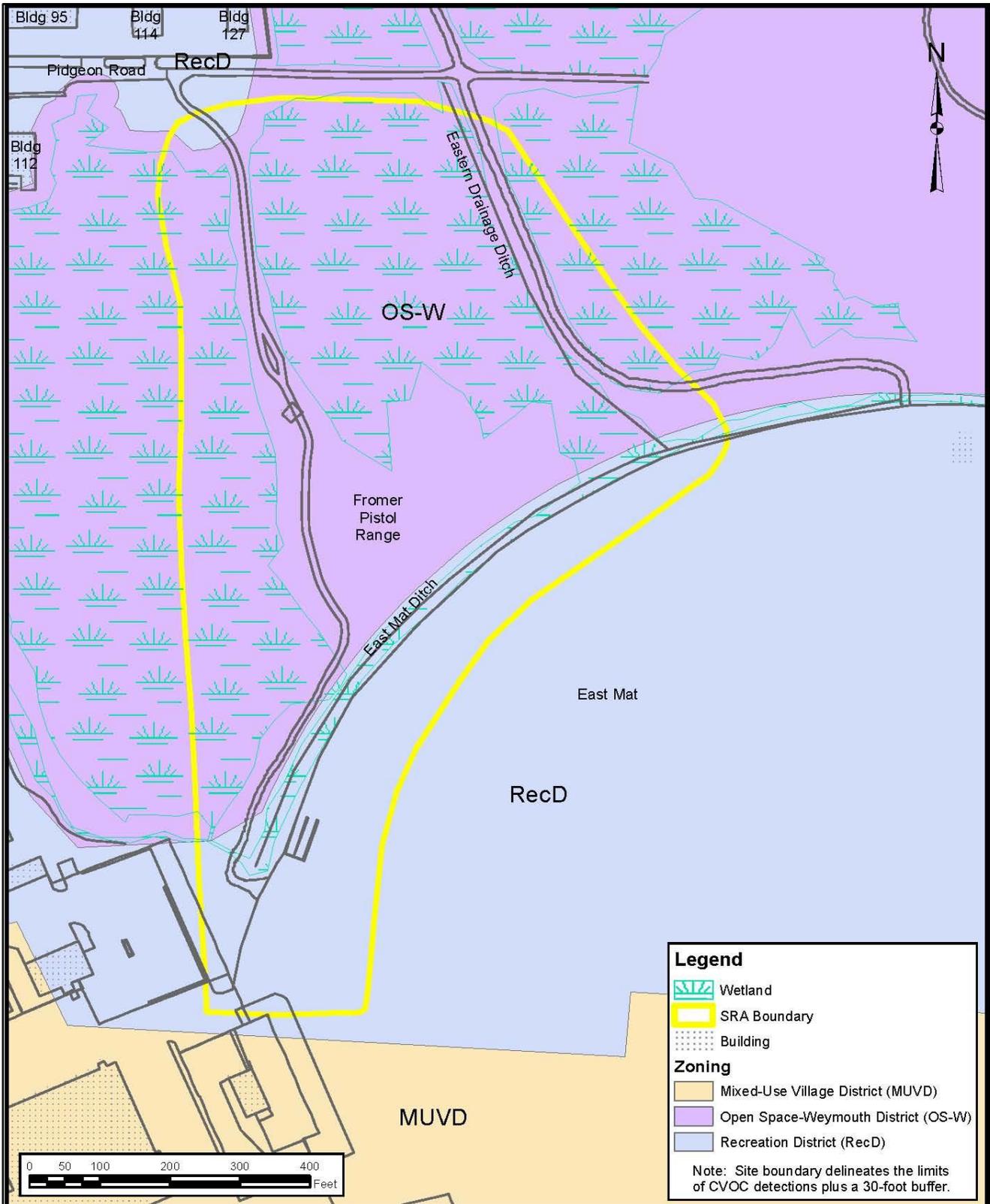


Figure 2 – SRA Site Features, Limit of CVOC Detections in Groundwater, and Zoning

**TABLE 1
COMPARISON OF REMEDIAL ALTERNATIVES**

ALTERNATIVE NUMBER	G-1	G-2	G-3	G-4	G-5	G-5A
<i>Estimated Timeframes (years)</i>						
Designing and constructing the alternative	NA	<1	<1	<1	<1	<1
Achieving the cleanup objectives	NA	70	70	70	55	55
CRITERIA ANALYSIS						
<i>Threshold Criteria</i>						
Protects human health and the environment: • Will it protect you and the animal life on and near the site?	⊙	○	○	●	●	★
Meets federal and state regulations: • Does the alternative meet federal and state environmental statutes, regulations and requirements?	⊙	●	●	●	●	●
<i>Primary Balancing Criteria</i>						
Provides long-term effectiveness and is permanent: • Do risks remain from wastes left on site? • Are the controls adequate and reliable?	⊙	○	●	●	★	★
Reduces, mobility, toxicity and volume of contaminants through treatment: • Are the harmful effects of the contaminants, their ability to spread, and the amount of contaminated material present reduced?	⊙	⊙	●	●	★	★
Provides short-term protection: • How soon will the site risks be reduced? • Are there hazards to workers, residents, or the environment that could occur during cleanup?	⊙	○	○	○	●	●
Can be implemented: • Is the alternative technically feasible? • Are the goods and services necessary to implement the alternative readily available?	★	●	○	○	○	○
Cost (\$): * • Up-front costs to design and construct the alternative (called capital costs) • Operating and maintaining any system associated with the alternative (called O&M costs) • Total cost in today's dollars (called the present worth cost)	11K 109K 120K	180K 923K 1.1M	920K 1.7M 2.6M	1.1M 2.1M 3.2M	1.6M 2.0M 3.6M	1.8M 2.4M 4.1M
<i>Modifying Criteria</i>						
State agency acceptance: • Do state agencies agree with the Navy's recommended alternative?	To be determined after the public comment period					
Community acceptance: • What objections, suggestions, or modifications does the public offer during the public comment period?	To be determined after the public comment period					
Notes: ★ = Best ● = Better ○ = Good ⊙ = Poor K = Thousand M = Million						
* For cost estimating purposes all O&M costs represent a 30-year timeframe. Actual costs will be higher for the full duration of the remedial action.						

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GLOSSARY OF TERMS

Analyte: A substance or chemical constituent that is determined in an analytical procedure.

Applicable Relevant and Appropriate Requirements (ARARs): Federal environmental and state environmental and facility siting statutes and regulations that must be complied with for each alternative. The ARARs vary depending on the alternative being proposed.

Background Level: Concentrations of chemicals present in the environment due to naturally occurring geochemical processes and sources, or to human activities not related to specific point sources or source releases.

Benchmark: Concentration of a chemical considered to be protective of human health or the environment.

Chemicals of Concern (COCs): Chemicals of concern are chemicals identified in the risk assessments as the primary drivers of unacceptable risks.

Chemicals of Potential Concern (COPCs): Chemicals of potential concern are chemicals found at a site at concentrations above federal and state risk-screening levels and therefore are included in the risk assessment evaluations.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA): A federal law passed in 1980 and amended in 1986 by the Superfund Amendments and Reauthorization Act (SARA). These laws created a system and funding mechanism for investigating and cleaning up abandoned and/or uncontrolled hazardous waste sites. The Navy's cleanup of sites regulated by CERCLA/SARA is funded by the Department of Defense under the Defense Environmental Restoration Fund.

Environmental Baseline Survey: An environmental assessment conducted by the Navy at bases that have been closed under the Base Realignment and Closure (BRAC) Act.

Feasibility Study (FS): A description and engineering study of the potential cleanup alternatives for a site.

Groundwater: Water found beneath the earth's surface that fills pores and cracks between materials such as sand, soil, gravel, or rock.

Land Use Control (LUC): Any legal or administrative restriction that prevents access or certain uses of a property.

Monitoring Well: A monitoring well is drilled at a specific location on or off a waste site. Groundwater can be sampled at selected depths, studied to determine the direction of groundwater flow, and analyzed to determine the types and quantities of chemicals present in groundwater.

Operable Unit: A site or sites being addressed collectively under the CERCLA process.

Proposed Plan: A CERCLA document that summarizes the preferred cleanup remedy for a site and provides the public with information on how they can participate in the remedy selection process.

Record of Decision (ROD): A CERCLA legal, technical, and public document that explains the rationale and final cleanup decision for a site. It contains a summary of the public's involvement in the cleanup decision.

Remedial Action Objective (RAO): A goal that is set to protect human health and the environment, and provide the basis to select cleanup methods. The RAOs must be met by the selected remedial alternative.

Remedial Investigation (RI): A step in the CERCLA process that involves a full characterization of the nature and extent of the chemicals at a site and determines whether or not the chemicals present a significant risk to human health or the environment.

Responsiveness Summary: A document included in the ROD which contains the responses to the formal comments submitted by the public regarding the Proposed Plan.

For More Information...

Contacts

If you have questions or comments about this Proposed Plan, or any other questions about the SRA Site, please contact us:

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Information Repositories

Documents relating to environmental cleanup activities for the former NAS South Weymouth property are available for public review at the following information repositories:

Tufts Library
46 Broad Street
Weymouth, MA 02188
(781) 337-1402

Abington Public Library
600 Gliniewicz Way
Abington, MA 02351
(781) 982-2139

Department of the Navy
Caretaker Site Office
c/o David Barney
1134 Main Street, Building 11
South Weymouth, MA 02190
(617) 753-4656

Hingham Public Library
66 Leavitt Street
Hingham, MA 02043
(781) 741-1406

Rockland Memorial Library
20 Belmont Street
Rockland, MA 02370
(781) 878-1236