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PROPOSED PLAN BUILDING 82 OPERABLE UNIT 11 (OU11) NAS SOUTH WEYMOUTH MA
7/1/2012
U S NAVY

Proposed Plan

Building 82 (Hangar 2) – Operable Unit 11
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 Building 82 (Hangar 2) Site at the former Naval Air Station (NAS) South Weymouth in Weymouth, Massachusetts. **The Navy's proposed remedy for the Building 82 Site is chemical oxidation, land use controls, and monitoring**. This document summarizes the proposed remedy and describes how to become involved in the decision-making process.

Let us know what you think!

Mark Your Calendar!

PUBLIC COMMENT PERIOD
August 1, 2012 to August 31, 2012

The Navy will accept written comments on the Proposed Plan for the Building 82 Site during this period. Send written comments postmarked no later than August 31, 2012 to:

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

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

PUBLIC MEETING AND PUBLIC HEARING – August 9, 2012

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.

Introduction

This Proposed Plan provides information to the public on the proposed cleanup plan for the Building 82 Site (the 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 Building 82 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 this document.

The Navy (as the lead agency) works closely with the U.S. Environmental Protection Agency (EPA) 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.

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). 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 and maintenance actions completed at the Building 82 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 all comments received during the comment period and public hearing in a document called the Responsiveness Summary. The Navy, with input from EPA 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 the Record of Decision (ROD). The Responsiveness Summary will be issued with the ROD.

This Proposed Plan summarizes key information from previous reports concerning the Building 82 Site. More detailed information can be found in the reports completed for the Site and referenced in this Proposed Plan. The documents are available for review at the Information Repositories 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 the environmental activities completed for the Site.

The CERCLA Process and the Building 82 Site

The Building 82 Site is one of several sites, or CERCLA Operable Units (OUs), located at former NAS South Weymouth (see Figure 1). Each step in the CERCLA process was completed by the Navy with input from the EPA and MassDEP.

Building 82 was first investigated when the interior floor drains were removed as part of Base closure in 1998. Soil samples were collected to determine if material in the floor drains had contaminated the soil below. When concentrations of chemicals in the soil were found to exceed MassDEP criteria, a Phase I Site Investigation (SI) was performed under the supervision of the MassDEP as RTN 3-18110.

The area outside the hangar was first investigated in 1998 as part of the Environmental Baseline Survey (EBS) program as Review Item Area (RIA) 30A and 30B. Work plans for the EBS investigations, which described the number of samples, locations and media, and analytical parameters, were developed in collaboration with the EPA and MassDEP.

As part of the EBS program and CERCLA process, samples were collected and analyzed for potential contaminants of concern. The results were screened against background values for the Base, human health risk-based benchmarks, and ecological risk-based benchmarks.

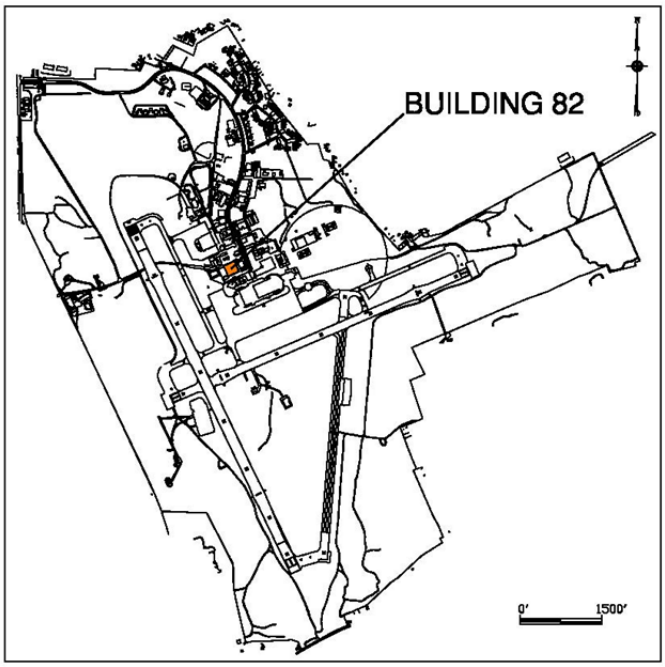

Figure 1 – Building 82 Location

The 2002 Decision Document for RIA 30A recommended that all environmental investigations at Building 82 be combined into a single site under CERCLA. From that point forward, the Building 82 Site, including the two RIAs, the area inside the hangar, and the apron surrounding the hangar, became Installation Restoration (IR) Site 10, also referred to as OU 11.

The Navy has performed various maintenance actions at the Site. Post-excavation samples were collected for analysis and any removed soil or sediment was disposed off-site. Where sample results exceeded benchmarks, additional excavation was performed, and additional post-excavation confirmatory samples were collected.

The Navy has conducted many investigations at the Site, culminating in the February 2010 Remedial Investigation (RI), which included the results of previous environmental investigations and maintenance actions. 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). An RI Addendum, prepared to fill data gaps identified in the RI, was completed in July 2011. A Feasibility Study (FS), prepared to evaluate potential cleanup alternatives, was completed in July 2012. The cleanup plans for the Building 82 Site are not expected to affect the strategy or progress of environmental investigations at other sites at the Base.

Information about the 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 and Characteristics

Where is Building 82?

Building 82 is a large structure located in the central portion of the Base (Figures 1 and 2). The Building 82 Site includes the hangar, concrete apron and ditches to the north, south, and west of the hangar, as well as the paved area east of the hangar. Further details regarding the Building 82 Site are shown on Figure 5 at the end of this document.

What was Building 82 used for?

Building 82 was constructed in 1956 as an aircraft storage and maintenance facility for fixed wing aircraft. The western portion of the building was a two-story shop and office area, with various spaces for light industrial activities (primarily related to aircraft maintenance), storage, offices, and classrooms.

After Base closure, Building 82 was used until 2000 for the storage of miscellaneous Navy-owned vehicles (i.e., plows, backhoes, buses, etc.). Building 82 is currently vacant.

What does Building 82 look like today?

Building 82 is a large concrete frame building with two large doors (Figure 2). The area around the

Figure 2 – Present View of Building 82 Facing South

hangar is covered by concrete and asphalt pavement. The former floor drain systems have been removed and the impacted soils were excavated and disposed of off-site.

What were the investigation results?

Several investigations and maintenance actions were conducted in multiple phases at Building 82 (see Environmental Investigations text box). The following provides an overview of the actions performed and summarizes the analytical results from the environmental investigations.

Floor Drain and Soil Removal

The Navy conducted a series of floor drain removals in 1998, 2000, 2006, and 2010 as maintenance actions to support Base closure.

In September 1998, the interior floor drains and associated gas-trap manholes (GTMs) were emptied and cleaned. The oil-water separator (OWS) associated with the system was cleaned and removed. All outlets to and from the OWS and manholes were plugged. Analyses of the residual sludge removed from the GTMs indicated elevated concentrations (1 to 3 orders of magnitude higher than screening criteria) of three volatile organic compounds (VOCs) and one polychlorinated biphenyl (PCB) compound. The sludge also contained several metals and total petroleum hydrocarbons (TPH).

Five borings were advanced adjacent to the GTMs and OWS to collect soil samples. The analytical results indicated the presence of VOCs and polycyclic aromatic hydrocarbons (PAHs), which are a group of semi-volatile organic compounds (SVOCs). PCBs were also detected in soil at relatively low concentrations. The only analytes reported at levels exceeding screening criteria were volatile petroleum hydrocarbons (VPHs). This result prompted the Site to be investigated further under an MCP Phase I Initial Site Investigation (SI).

Between June and September 2000, a second maintenance action was conducted to remove the floor drain systems and assess soil conditions beneath the drainage pipes in the hangar. All floor drains were removed except for six floor drains in the shop/office areas, which were left in place due to heavy equipment access issues. Samples were collected from the soil beneath the floor drains at regular intervals and wherever staining or odors were noted. Chemicals detected in the soil samples included: VOCs; SVOCs, including PAHs; PCBs; metals; extractable petroleum hydrocarbons (EPH); and VPH.

Between April and June 2006, a maintenance action was conducted to remove the remaining six floor drains from the interior of the shop/office area in Building 82 and to assess soil conditions beneath each system. Following pipe removal, soil samples collected from the trench floor beneath the former drains were screened in the field for PCBs and TPH. Based on the field screening results, additional exploratory samples were collected from beneath the drain pipes for laboratory analysis. The laboratory results indicated the presence of SVOCs, EPHs, VPHs, and lead in soils at concentrations exceeding MCP RCS-1 criteria.

Locations with results exceeding criteria were marked and the trenches backfilled with clean fill. The area where lead was detected at a concentration significantly exceeding screening criteria was excavated to a depth of 3 feet below the base of the pipe removal.

Sediment was present in the pipes removed from two floor drains. Samples of the sediment were collected and analyzed; several SVOCs, VOCs and metals were detected. Concentrations of the contaminants were generally at least an order of magnitude higher in the pipe sediment than in the underlying soil.

Environmental Investigations

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

1998: As part of base closure activities, the Navy cleaned floor drains and GTMs and removed an OWS from the hangar. Based on the results of sludge samples from the GTMs a Phase I SI was performed. Soil samples were collected and monitoring wells installed to assess contamination.

2000: The Navy removed the floor drains within the hangar and outside Building 82.

2000 and 2002: The Navy collected soil, sediment, and surface water samples to study the area adjacent to the hangar apron and spills on the apron. These investigations were combined with the work at the hangar itself as a single site under CERCLA.

Late 2002: The drainage ditch and storm sewer system around Building 82 were sampled and cleaned as part of the larger storm sewer cleaning effort for Area of Concern (AOC) 61.

2003: The Navy conducted a Due Diligence investigation to support Early Transfer Authority, which included soil sampling (including using angled borings to drill under the building), monitoring well installation, groundwater sampling, and a surface geophysical investigation.

2005-2006: The Navy performed an RI to evaluate the full extent of contamination. Soil, groundwater, sediment, and surface water samples were collected (Figure 3). The RI included an HHRA and ERA to determine risks to human health and ecological receptors posed by the Site.

2007: The developers of the Base excavated soil from the area northeast of the hangar to construct an access road. Soils with concentrations above the screening criteria were disposed of off-site.

2009-2010: Navy collected additional groundwater samples to resolve data gaps identified in the RI (Figure 3).

2010: The rest of the piping was removed and the soil beneath was tested. Additional soil was removed from the access road area, and additional sediment was removed from the drainage ditch north of Building 82.

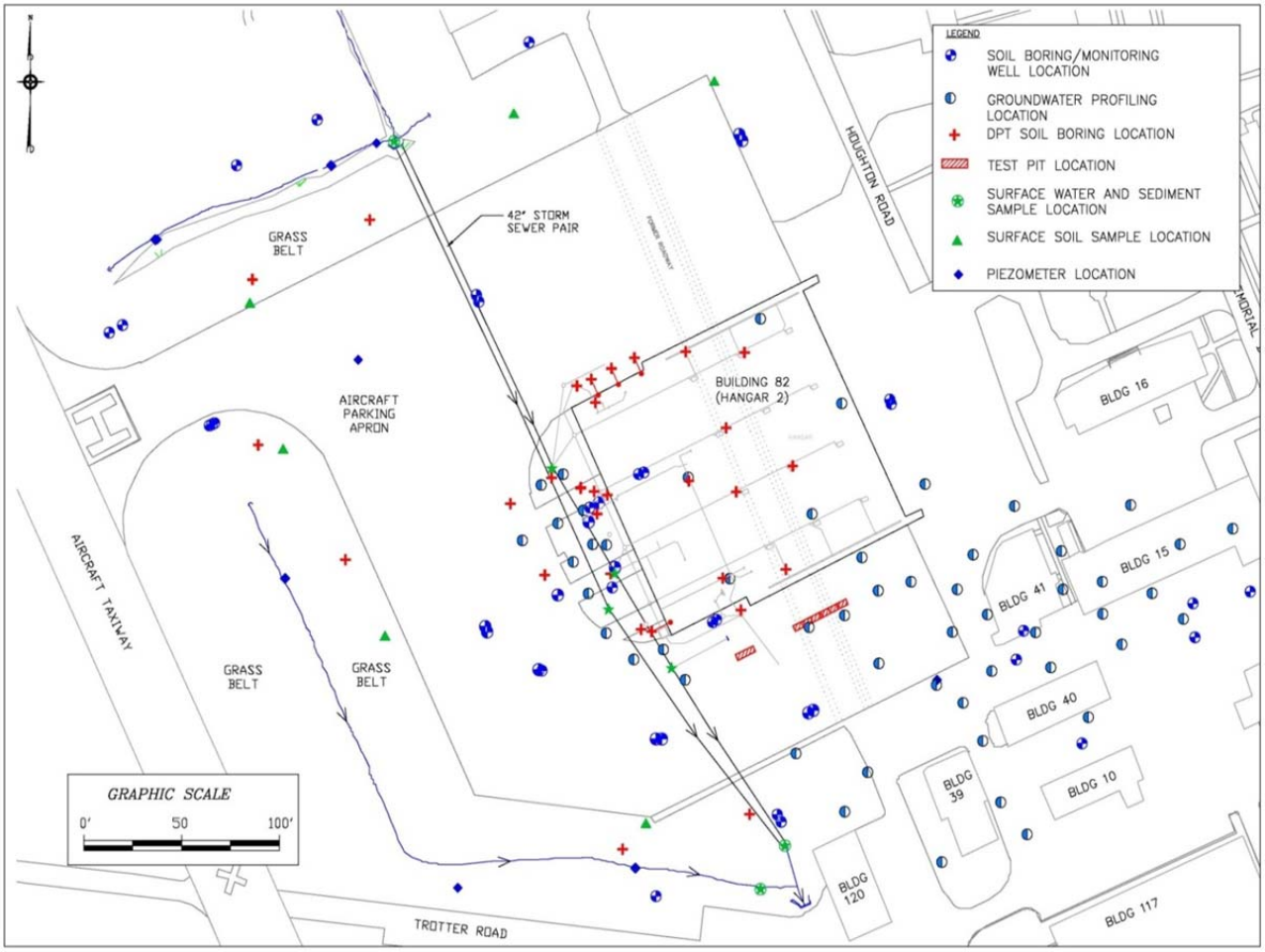

Figure 3 – RI & RI Addendum Sample Locations

In 2010, the Navy completed a further maintenance action. The additional work included advancement of 10 borings to the west of the hangar: 4 borings near the location of MW-200 northwest of the hangar, and 6 borings inside the building near the former (now removed) floor drain system. Four GTMs west of the hangar and associated piping from the outer wall of the hangar out to the storm drain system were then removed. Soils were excavated to a depth of 15 feet. Approximately 416 cubic yards of soil were removed. Confirmation samples collected at the base and side-walls of the excavation were below cleanup criteria. The excavation was then backfilled with clean fill.

Access Road Excavations

In September 2007, soil in the grassy strip north and northeast of Building 82 was excavated to construct an access road. This work was performed under an easement granted by the Navy to LNR South Shore LLC. The top 1 to 2 feet of topsoil were removed and stockpiled in the access road area. Soils beneath the topsoil were excavated, screened, and reworked to the anticipated depth of utility installation (8 to 9 feet). Soils with concentrations greater than screening criteria were stockpiled separately for off-site disposal.

In September 2010, the Navy performed a Limited Removal Action and excavated soils in the northern side of the Site, where the 2007 access road excavations had encountered petroleum-impacted material. The confirmation samples met the screening criteria and the excavations were then filled with clean fill material. Approximately 100 cubic yards of soil were removed.

Drainage Ditch and Storm Sewer Cleaning

In 2002, the drainage ditch located west and south of Building 82 was cleaned as part of the AOC 61 (TACAN Outfall) non-time critical removal action. The work included excavation of 700 linear feet of the drainage ditch. Post-excavation confirmatory samples indicated that no sediment concentrations exceeded the screening criteria.

In September 2010, Navy returned to the drainage ditch north of Building 82, where PAHs had been

detected in an RI sediment sample upstream of the Site. Fifteen linear feet of each drainage section were excavated to a depth of 1 foot below ground surface; approximately 50 cubic yards of sediment were removed. Confirmatory sample concentrations did not exceed screening criteria. The drainage ditch was re-sloped, lined with an erosion-protective fabric, and re-seeded once excavation was completed.

Remedial Investigation Results

The results of the environmental investigations and maintenance actions completed between 1998 and 2003 (see text box on page 4) were used in planning the RI; analytical results that were validated in accordance with EPA guidelines were used in the RI data analysis. All samples collected during the RI and RI Addendum are shown on Figure 3 on the previous page.

Figure 4 – Groundwater Profiling, Spring 2009

All of the wells installed for the various investigations were re-sampled as part of the RI, and the results were used in the data analysis to provide a complete picture of current conditions. In addition, soil results from the EBS investigations at RIA 30A and RIA 30B, the Phase I Initial SI, and the Limited Due Diligence Assessment were used to determine the nature and extent of contamination and risk at the Site. The surface geophysics conducted as part of the Limited Due Diligence Assessment was used to plan sampling locations and help determine bedrock elevations for the bedrock surface map.

Analytical data used in the RI included surface water (from the drainage ditches around the apron and from manholes leading to the storm sewer), sediment from the drainage ditches, groundwater, and soil samples.

The RI, which was issued in February 2010, compiled the results of all the site investigations and reported the following contaminants detected at the Site:

VOCs — Numerous VOCs were detected in soil and groundwater; fewer VOCs were detected in surface water, and none were detected in sediment. Most of the VOCs detected in soil and the highest concentrations in groundwater were from the vicinity of GTM 2, which was removed and the surrounding soils excavated in 2010. 1,1,1-trichloroethane (TCA) was detected in groundwater near GTM 2. The most common groundwater VOC was trichloroethene (TCE), which is located in a plume beneath the southern apron and area to the east.

SVOCs — The SVOCs, which consist mainly of PAHs, were detected in all media. PAHs were widely detected in soil and sediment. The primary soil and sediment PAHs are benzo(a)pyrene, benzo(a)anthracene, benzo(b)fluoranthene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene. PAHs were detected infrequently in groundwater. The primary groundwater PAH was naphthalene, which was associated with GTM-2 and floor drain D5.

Pesticides — Pesticides were detected in all media but generally infrequently and at low concentrations. The only pesticides detected at concentrations above screening criteria were gamma-chlordane and heptachlor epoxide in deep groundwater.

PCBs — PCBs were detected in all media at low concentrations.

Metals — Metals were detected in all media. Four metals (arsenic, manganese, vanadium, and iron) were detected in all media at concentrations above screening criteria. However, metal concentrations were generally below Base background concentrations, and there was no apparent pattern of elevated concentrations that would indicate disposal or another site-related source of metals.

RI Addendum Results

In 2009 and 2010, a supplemental investigation including multiple groundwater profiling rounds was performed to address data gaps identified during completion of the RI and development of the FS (Figure 4). The results were compiled in an RI Addendum. The supplemental investigation included the following:

- Collection of groundwater samples in the vicinity of a previous soil boring (SB-112) to see if VOC concentrations had impacted groundwater in the area. No VOCs were detected in the groundwater.

- Re-sampling selected monitoring wells to determine if the PCBs detected in groundwater during the 2006 RI were still present. No PCBs were detected.

- Collection of additional groundwater samples to determine the upgradient extent of TCE groundwater concentrations in the area of the southern apron. Groundwater was sampled in several phases. The investigations found that TCE concentrations in the deep overburden were highest immediately southeast of Building 15, possibly from a catch basin nearby. TCE concentrations in the shallow overburden were much lower and restricted to a narrow band located southeast of the hangar.

The TCE plumes delineated in the RI Addendum showed the TCE origin to be outside the original site boundaries. Therefore the Site boundary was expanded to include the full TCE plume and Building 15. The extent of groundwater contamination is more fully shown on Figure 5.

Summary of Site Risks

The samples evaluated in the RI were used in the risk assessments to determine if site concentrations posed a threat to human health and/or the environment.

Human Health Risks

The Navy conducted an HHRA to determine whether detected concentrations of chemicals at the Building 82 Site pose an unacceptable risk to human health. A four-step process 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 (EPA 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.

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. EPA'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.

Risks from lead exposure are evaluated using a different methodology. Estimations of blood-lead concentrations are used to evaluate potential adverse health effects. Infants and young children are extremely susceptible to adverse effects from exposure to lead. Blood-lead levels (either fetal or young child) greater than 10 µg/dL are considered to be a "concern." EPA's stated goal for lead is that individuals exposed would have no more than a 5 percent probability of exceeding the level of concern of 10 µg/dL.

Under current use scenarios, potential risks to onsite workers and child trespassers were evaluated. Potential exposure pathways for current use scenarios included touching or incidental ingestion of soil, sediment, or surface water.

Under future use scenarios, potential risks were evaluated for future recreational visitors, residents, commercial and industrial workers and construction workers. Potential exposure pathways included: touching or incidental ingestion of soil, sediment and surface water; drinking groundwater; inhalation of fugitive dust; and inhalation of volatile constituents in groundwater.

The 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 Building 82 area is located within the "Village Center District" zone. This is a mixed use zoning district including high-density housing, offices, commercial and retail uses. See Figure 5 for details.

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 - Characterization of the Risk. Lastly, the results from the exposure and toxicity assessments were combined to calculate the overall risks from exposure to site COPCs. The text box on page 7 describes how risk calculations are expressed.

Conclusions – For future residents, groundwater used as drinking water is the only pathway with hazard indices exceeding 1 and cancer risks exceeding the EPA cancer risk range. The major contributors to cancer risk in groundwater are: arsenic; n-nitroso-di-n-propylamine (SVOC); 1,1-dichloroethane, benzene, chloroform, tetrachloroethene, and TCE (VOCs); Aroclor-1248 (PCB); and heptachlor epoxide (pesticide).

While the HHRA found that there was a potential risk for future construction workers from inhalation of dust and volatiles in trench air, additional risk analysis performed since the time the HHRA was completed has shown that no construction worker risk is present at the Building 82 Site. In addition, the 2010 maintenance action removed COCs in soils. The HHRA also concluded that no unacceptable risks to building occupants or residents exist from surface water, or from inhalation of volatile constituents in groundwater at the Building 82 Site.

Ecological Risks

The ecological risk assessment for the Site 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 at the Site), the COPCs, and the potential exposure pathways. The Navy evaluated the following receptor groups: terrestrial plants and invertebrates; sediment invertebrates; aquatic organisms; and terrestrial receptors. Animal receptors included small mammals, birds, reptiles, amphibians, and insects.

A screening evaluation selected as COPCs the chemicals with concentrations which exceeded media-specific screening values or which did not have screening values. The COPCs for exposed surface soil included: 2 VOCs; 10 individual SVOCs; 4 pesticides; 1 PCB; and 7 metals. COPCs for sediment included: 1 VOC; 21 individual SVOCs and total PAHs; 4 pesticides; and 3 metals. COPCs for surface water included: 3 VOCs; 1 SVOC and total PAHs; and 3 metals. These COPCs were evaluated further in Step 2.

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

Potential exposure for terrestrial and wetland vertebrates was determined in food chain models based on the sampling data, and also included estimates of COPC exposure via ingestion of plant and animal tissue. These biota concentrations were extrapolated from concentrations in abiotic media using bioaccumulation factors cited in technical literature. 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.

Although several chemicals were initially selected as COPCs for each receptor group, it was determined that risks to ecological receptors at the Building 82 Site were not sufficient to warrant further evaluation of ecological risk.

Remedial Action Objectives

Remedial Action Objectives (RAOs) are the goals that a cleanup plan must achieve. They are established to protect human health and the environment, and to comply with all relevant federal and state regulations. Based on the risk assessments, an FS was required to address the identified human health risks in groundwater. The following RAOs were identified for groundwater at the Building 82 Site:

1. Prevent human exposure to groundwater containing concentrations of contaminants in excess of the remedial goals and that cause unacceptable risk.

2. Prevent or minimize migration of contaminants in groundwater.

3. Restore groundwater quality at the Building 82 Site such that there are no risks to human health preventing its permissible beneficial use.

Preliminary Remediation Goals

Preliminary Remediation Goals (PRGs) were developed for the Building 82 Site and are identified in the FS. PRGs for groundwater in the portion of the

Building 82 Site located in the Potentially Productive Aquifer (PPA) are tied to drinking water standards.

Summary of Remedial Alternatives

Remedial alternatives, or cleanup options, were identified for the Site in the FS. The alternatives were selected to meet the RAOs listed above.

For each remedial alternative except No Action, Land Use Controls (LUCs) would be implemented on an interim basis to prevent unacceptable risks from exposure to contaminants in groundwater until the PRGs are achieved. The LUCs would: (1) prohibit the installation of groundwater extraction wells for production, supply, or irrigation at the Building 82 Site; and (2) require that EPA and MassDEP approval of construction dewatering plans be obtained prior to conducting any construction dewatering activities at the Site. The LUCs will be narrowly tailored to prevent specific identified risks and exposure scenarios identified in the HHRA and will be limited in scope, duration and location so as not to unreasonably burden or prohibit foreseeable uses anticipated by the Reuse Plan. The LUCs would be implemented through a LUC Remedial Design (RD) as part of the overall RD for the selected remedy.

Annual inspections of the Site would be conducted to confirm compliance with the LUC objectives, and an annual compliance certificate would be prepared and provided to EPA and MassDEP. Prior to any property conveyance, EPA and MassDEP would be notified.

The interim LUCs would be maintained for as long as they are required to prevent unacceptable exposure to contaminated groundwater for production, supply, or irrigation use and/or to preserve the integrity of the selected remedy.

Each alternative is described below.

Alternative G-1: No Action

A “no action” alternative is one where no cleanup remedies or LUCs would be applied. This is required under CERCLA and serves as a baseline for comparison with other alternatives.

Alternative G-2: Chemical Oxidation, Land Use Controls, and Monitored Natural Attenuation

This alternative consists of injection of a strong chemical oxidant. A grid of borings and injection wells would be used to inject the oxidant within the deep and shallow groundwater source area. One injection is estimated to be sufficient to chemically oxidize the VOCs in approximately 2 years and achieve RAO No. 2. A pilot study would be conducted to confirm injection spacing and oxidant application rates.

Interim LUCs would be implemented as described in the Summary of Remedial Alternatives. RAO No. 1 would be achieved immediately upon implementation of the interim LUCs.

Natural attenuation would rely on naturally occurring processes to reduce the concentrations of COCs and restore the aquifer to its beneficial use. Groundwater samples would be collected from selected monitoring wells and analyzed for the target analytes and natural attenuation parameters. Sampling frequency would be quarterly for the first year, semi-annually for the next two years, and annually thereafter. Prior to the remedial design, a baseline groundwater sampling event would be conducted to establish baseline conditions and to assist in the preparation of the long-term monitoring plan. Further investigation or remedial action for PCBs in groundwater will be considered if PCBs are detected during monitoring.

Natural attenuation would achieve RAO No. 3 in approximately 20-25 years. Since the time for manganese concentrations to reach its PRG is uncertain, monitoring for manganese is assumed to be required for the entire 30-year cost evaluation period. Five-year reviews would be performed as long as contaminants are present at concentrations that prevent unrestricted site use.

Alternative G-2A: Chemical Oxidation, Land Use Controls, and Monitoring

This alternative consists of injection of a strong chemical oxidant. A grid of borings and injection wells would be used to inject the oxidant within the deep and shallow groundwater source area. A phased approach would be used for the injections so that performance data from the first phase can be used to optimize the injection well spacing and injection rates in the second phase. The first injection would be in the higher concentrations in the center of the plume. Information from the first phase would be used to optimize the well spacing and injection rates and the quantities for the second injection. Performance monitoring would be performed at semi-annual intervals for 3 years after the second injection to confirm that the groundwater concentrations are less than PRGs and that no rebound has occurred.

Interim LUCs would be implemented as described in the Summary of Remedial Alternatives. RAO No. 1

would be achieved immediately upon implementation of the interim LUCs.

Prior to the remedial design, a baseline groundwater sampling event would be conducted to establish baseline conditions and to assist in preparation of the long-term monitoring program. As part of the long-term monitoring program groundwater samples from selected wells will be collected for other analytes of interest, such as manganese, PCBs, and MTBE. Samples will be collected quarterly for the first year, semi-annually for the following two years, and annually thereafter. Naturally occurring processes within the aquifer would reduce the concentrations of manganese. Manganese concentrations would be primarily reduced through dispersion, dilution through aquifer movement, and by precipitation of manganese into groundwater zones with oxidizing conditions. Five-year reviews would be performed as long as contaminants are present at concentrations that prevent unrestricted site use.

Alternative G-2A is expected to achieve RAO Nos. 2 and 3 for the VOCs within 2 years. Since the time for manganese concentrations to reach its PRG is uncertain, monitoring for manganese is assumed to be required for the entire 30-year cost evaluation period.

Alternative G-3: In-Situ Enhanced Bioremediation, Land Use Controls, and Monitored Natural Attenuation

This alternative uses a variety of nutrient solutions (emulsified oil substrate [EOS], oxygen release compound [ORC], or other bioaugmentation solutions) to assist in the microbial breakdown of contaminants. Borings and injection wells oriented along lines to form barriers would be used to inject the solution within the deep and shallow groundwater source area. A pilot study would be conducted to confirm injection spacing and solution application rates.

Enhanced bioremediation is expected to achieve RAO Nos. 2 and 3 in approximately 20 years, with EOS injections every 5 years. Existing monitoring wells would be used to monitor the progress and effectiveness of EOS injections. In the first year, samples would be collected quarterly and analyzed for field parameters and COCs. After the first year, samples would be collected and analyzed annually.

The natural attenuation components would be the same as for Alternative G-2. Groundwater samples would be collected from selected monitoring wells and analyzed for the target analytes and natural attenuation parameters. Sampling frequency would be quarterly for the first year, semi-annually for the next two years, and annually thereafter. Prior to the remedial design, a baseline groundwater sampling event would be conducted to establish baseline conditions and to assist in preparation of the long-term monitoring plan. Five-year reviews would be performed as long as contaminants are present at concentrations that prevent unrestricted site use. Since the time for manganese concentrations to reach its PRG is uncertain, monitoring for manganese is assumed to be required for the entire 30-year cost evaluation period.

Interim LUCs would be implemented as described in the Summary of Remedial Alternatives. RAO No. 1 would be achieved immediately upon implementation of the interim LUCs.

Alternative G-4: Land Use Controls and Monitored Natural Attenuation

Natural attenuation would rely on naturally occurring processes within the aquifer to reduce the concentrations of COCs. Contaminant concentrations would be reduced through biological activity, dispersion, and dilution through aquifer movement and adsorption on soil particles. Aquifer conditions would be monitored to ensure that concentrations are being adequately reduced through natural processes.

The monitoring frequency would be quarterly for the first year, semi-annually for the next two years, and annually thereafter. Prior to the remedial design, a baseline groundwater sampling event would be conducted to establish baseline conditions and to assist in the preparation of the long-term monitoring plan.

Based on preliminary modeling, an estimated 40 to 60 years are needed to achieve RAO Nos. 2 and 3. Five-year reviews would be performed as long as contaminants are present at concentrations that prevent unrestricted site use.

Interim LUCs would be implemented as described in the Summary of Remedial Alternatives. RAO No. 1 would be achieved immediately upon implementation of the interim LUCs.

Evaluation of Alternatives

EPA 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. In the FS, each remedial alternative is individually evaluated 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 14 identifies the evaluation criteria and presents a summary of the evaluation of alternatives for the Site.

Preferred Alternative

In summary, the Navy is proposing Alternative G-2A, Chemical Oxidation, LUCs and Monitoring. The Navy has concluded that this remedy protects human health and the environment and achieves the overall goals established for the Site. The Navy proposes that this remedy be the final remedy for the Building 82 Site.

Overall, this alternative will include the following elements:

- Rapid reduction of contaminant concentrations in the source area and throughout the plume area through chemical oxidation of VOCs in shallow and deep groundwater.
- Monitoring including collection of groundwater and surface water samples for analysis of COCs and daughter products to evaluate the progress of remediation. Groundwater will also be monitored for other analytes of interest, such as manganese, PCBs, and MTBE. Samples will be collected quarterly for the first year, semi-annually for the following two years, and annually thereafter.
- Implementation of LUCs on an interim basis to prevent unacceptable risk from exposure to contaminants in groundwater and surface water until the PRGs are achieved. The LUCs will be implemented through a LUC RD as part of the overall RD for the selected remedy.
- Completion of annual site inspections to confirm compliance with the LUC objectives, and provide an annual compliance certificate to the regulators.
- Maintenance of the LUCs for as long as they are needed to prevent unacceptable exposure to contaminated groundwater and surface water.
- Completion of five-year reviews as long as COCs are present at concentrations that prevent unrestricted site use.

Next Steps

Community review of and comment on this Proposed Plan is the next step in the CERCLA process for the Building 82 Site. The Navy encourages the public to review this plan and to submit comments. The Navy will accept written comments on the Proposed Plan during the public comment period, August 1, 2012 to August 31, 2012. The Navy will accept oral comments during a Public Hearing that will follow a Public Meeting to be held on August 9, 2012, at the New England Wildlife Center, 500 Columbian Street, South Weymouth, Massachusetts.

Once the communities have commented on this Proposed Plan, the Navy and EPA will consider all comments received. The Navy's proposed remedial alternative could change based on community comments. The Navy will provide written responses to formal comments received on the Proposed Plan. These responses will be provided in a document called the Responsiveness Summary that will be part of the Record of Decision (ROD) for the Site.
The ROD will contain the rationale for the Navy's and EPA's decision for the Site. The Navy and EPA anticipate that all comments will be reviewed and the ROD will be signed by September 2012. The document will then be made available to the public at the Information Repositories listed at the end of this document. Also, the Navy will announce the availability of the ROD through the local news media and the community mailing list.

Commitment to the Communities

The Navy is committed to informing the communities about the environmental cleanup programs at NAS South Weymouth. A Restoration Advisory Board (RAB), composed of the community leaders, government agency representatives, and local citizens, meets regularly to discuss the environmental cleanup program at former NAS South Weymouth. At these meetings, you can learn about and offer suggestions on the Navy's cleanup program activities. RAB meetings are held on the second Thursday of every other month. Upcoming RAB meetings are publicized in local news media and are open to the public. Past meeting minutes are available on the 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. Details of the information summarized in this Proposed Plan are available for review at the information repositories listed at the end of this document.

Important Dates

Public Comment Period
August 1, 2012 to August 31, 2012

Public Meeting and Public Hearing
August 9, 2012

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 Building 82. The Navy will consider the comments received during the comment period before making the final decisions 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.

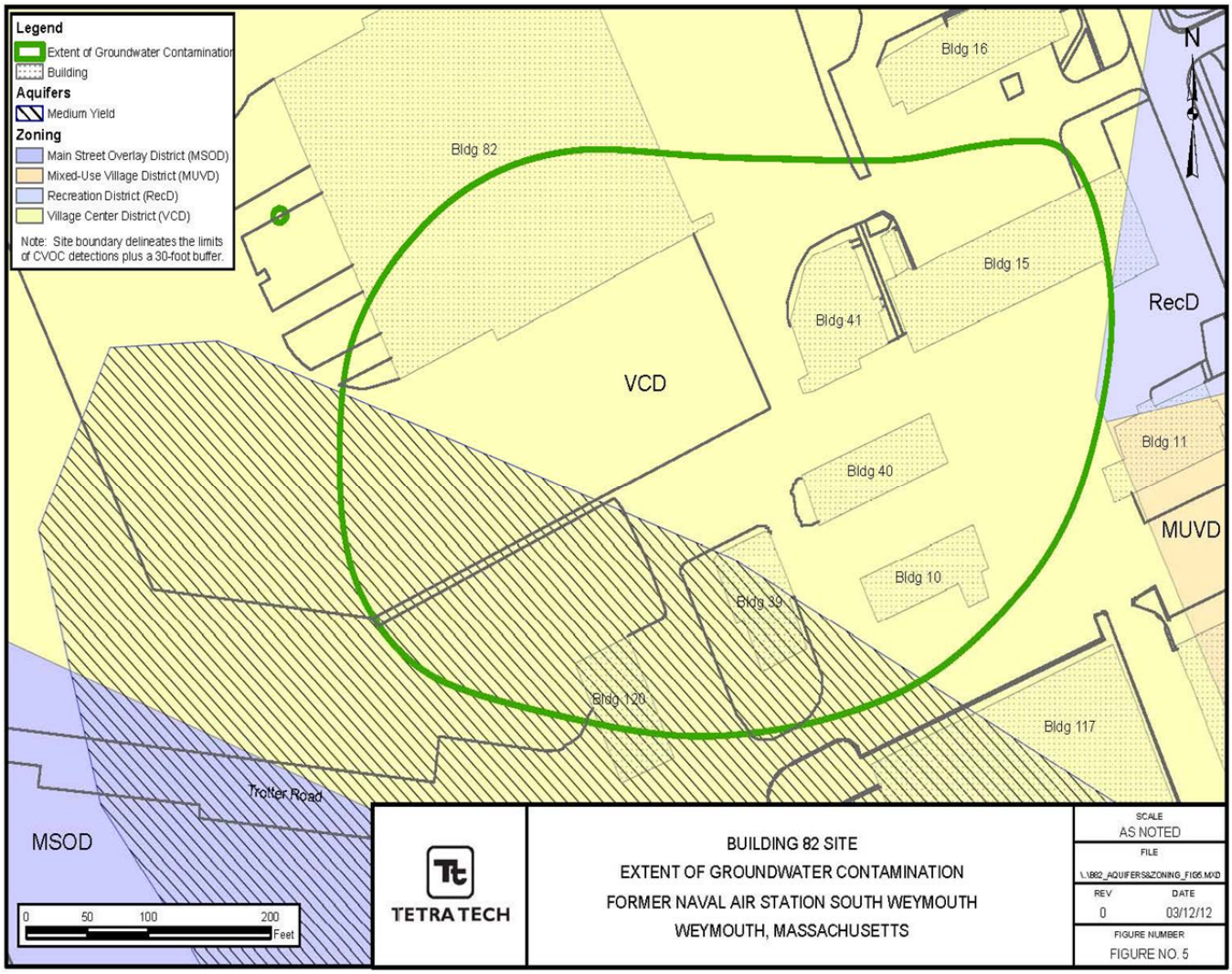

Figure 5 – Extent of Groundwater Contamination

TABLE 1

COMPARISON OF REMEDIAL ALTERNATIVES

Alternative No.	**G-1**	**G-2**	**G-2A**	**G-3**	**G-4**
Estimated Timeframes (years)					
Design and Construction of Alternative	NA	1	1	1	< 1
Groundwater treatment	NA	2	2	20	NA
Achieving the cleanup objectives for VOCs	NA	20	5	20	40+
Criteria Analysis					
Threshold Criteria					
Protects human health and the environment • Will it protect you and animal life on and near the site?	⦸	●	●	●	●
Meets federal and state regulations • Does the alternative meet federal and state environmental statues, regulations, and requirements?	⦸	●	●	●	●
Primary Balancing Criteria					
Provides long-term effectiveness and is permanent • Will the effects of the cleanup last?	⦸	●	●	●	○
Reduces mobility, toxicity, and volume of contaminants through treatment • Are the harmful effects of contaminants, their ability to spread, and the amount of contaminated material present reduced?	⦸	●	●	●	⦸
Provides short-term protection • How soon will the 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 (capital costs) • Operating and maintain any system associated with the alternative (O & M costs) • Total cost in today's dollars (net present worth cost)	 8K 109K 117K	 1.6M 1.1M 2.7M	 2.4M 875K 3.3M	 1.2M 1.6M 2.8M	 186K 1.1M 1.3M
Modifying Criteria					
State Acceptance	To be determined after the public comment period				
Community Acceptance					
● = Good ○ = Average ⦸ = Poor K = Thousand M = Million					

COMMENT SHEET – Proposed Plan for the Building 82 Site

Use this space to write your comments or to be added to the mailing list.

The Navy encourages your written comments on the Proposed Plan for the Building 82 Site, Former NAS South Weymouth, Weymouth, Massachusetts. You can use the form below to send written comments. If you have questions about how to comment, please contact Brian Helland at (215) 897-4912 or via email at brian.helland@navy.mil.

This form is provided for your convenience. Please mail this form or additional sheets of written comments, postmarked no later than August 31, 2012, to the address shown below:

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

Comment Submitted by: _____

Address: _____

_____

_____

_____

Affix
Postage

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

- - - -

GLOSSARY OF TERMS

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

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 such materials 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 and studied to determine the direction of groundwater flow and 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 final cleanup objective that 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 containing the responses to the formal comments submitted by the public regarding the Proposed Plan. This summary is appended to the ROD.

For More Information…

Contacts

If you have questions or comments about this Proposed Plan, or any other questions about the Building 82 Site, please contact us:

Mr. Brian Helland
Navy Remedial Project Manager
(215) 897-4912
brian.helland@navy.mil

Ms. Carol Keating
EPA Project Manager
(617) 918-1393
keating.carol@epa.gov

Mr. David Chaffin
MassDEP Project Manager
(617) 348-4005
david.chaffin@state.ma.us

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
Monday-Thursday: 9:00 – 9:00
Friday: 9:00 – 5:00
Saturday-Sunday: Closed

Abington Public Library
600 Gliniewicz Way
Abington, MA 02351
(781) 982-2139
Monday: 10:00 – 8:30
Tuesday, Thursday: 10:00 – 8:30
Wednesday, Saturday: 10:00 – 5:00
Friday: 2:30 – 5:00
Sunday: Closed

Department of the Navy
Caretaker Site Office
c/o David Barney
1134 Main Street, Building 11
South Weymouth, MA 02190
Monday-Friday: 10:00 – 4:00

Hingham Public Library
66 Leavitt Street
Hingham, MA 02043
(781) 741-1406
Monday-Thursday: 10:00 – 9:00
Saturday: 9:00 – 5:00
Sunday: 1:00 – 5:00

Rockland Memorial Library
20 Belmont Street
Rockland, MA 02370
(781) 878-1236
Monday: 10:00 – 5:00
Tuesday, Wednesday: 10:00 – 8:00
Thursday-Friday: 10:00 – 5:00
Saturday-Sunday: Closed