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PUBLIC NOTICE NAS BRUNSWICK ENVIRONMENTAL RESTORATION NEWS SUMMER
2009 NAS BRUNSWICK ME
6/1/2009
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Chief of Naval Operations Environmental Award Presented to Naval Air Station Brunswick

In February 2009, the winners of the Fiscal Year 2008 Chief of Naval Operations (CNO) Environmental Awards competition were named. Naval Air Station (NAS) Brunswick was one of three installations to receive this prestigious award for Environmental Restoration. The CNO Environmental Awards Ceremony was held on 28 May 2009 in Washington, D.C. at the U.S. Navy Memorial and Naval Heritage Center.

Lisa Joy (NAS Brunswick Environmental Director), Mike Fagan (NAS Brunswick Installation Restoration Program Manager), Paul Burgio (Base Closure and Realignment [BRAC] Environmental Coordinator) and Todd Bober (Navy Remedial Project Manager) accepted the FY08 CNO Environmental Award on behalf of NAS Brunswick. NAS Brunswick was presented the award for its significant progress in the Environmental Restoration Program, including accelerating investigations and establishing collaborative partnerships to expedite fieldwork and cleanup efforts. The accelerated pace and expanded scope of clean-up efforts have been possible through close cooperation and collaboration of the NAS Brunswick Navy Project Team and the Restoration Advisory Board, which consists of U.S. Environmental Protection Agency, Maine Department of Environmental Protection, and community stakeholders, including the Brunswick Area Citizens for a Safe Environment (BACSE) and Midcoast Regional Redevelopment Authority (MRRRA).

“What happens in our environment and to our natural resources is a matter of national security. What happens in our environment cannot be dealt with at some later date, it must be addressed now and we must keep it on our minds constantly.” (May 28, 2009) – Admiral Gary Roughhead, Chief of Naval Operations.

NAS Brunswick was the only BRAC base to receive a CNO Environmental Award this year!



Left to right, Todd Bober, Paul Burgio, Mike Fagan, Lisa Joy, Admiral Gary Roughhead, Chief of Naval Operations



Navy RAB Co-Chair's Message

Dear Midcoast Community Members,

As the last planes depart Naval Air Station Brunswick (NASB) this year, I remain

committed to maintaining an open and transparent relationship with the local community throughout the base's transition to the next phase of base closure. As part of this process, the Navy will continue to be good stewards of the environment and will remain committed to remediating the property that will be transferred for re-use, as required by law.

The environmental remediation process at NASB has been a collaborative effort with all Restoration Advisory Board (RAB) members, including the community, the regulatory agencies, the Brunswick Area Citizens for a Safe Environment (BACSE), and the Midcoast Regional Redevelopment Authority. This collaborative effort was recognized in May when NASB received the Fiscal Year 2008 Chief of Naval Operations Environmental Award for Environmental Restoration. This partnership between all RAB members was cited as a primary reason for the success of the clean-up program at NASB. With that spirit of collaboration and cooperation, the base has been able to increase the pace and scope of investigation and clean-up activities. Open and frank discussion of the NASB remediation process is critical to the community making sound decisions that impact the redevelopment process. The RAB can provide the experts able to communicate to the community, the town councils or any other interested organization.

Shortly, we will commence the comprehensive soil removal action at the Navy Exchange Service Station and the optimization efforts for the Eastern Plume groundwater treatment. As we embark on these and other projects, I invite every member of the community to get involved in the process by attending quarterly public RAB meetings held at the Parkwood Inn. In addition, you may obtain information regarding the remediation program from our website (<http://nasbrunswick.navy-env.com>) or by visiting the Curtis Memorial Library for information contained in the Administrative Record.

Through a spirit of teamwork and commitment, we can all work together to be good stewards of the environment. I look forward to seeing you at the next RAB meeting.

Sincerely,
Captain William Fitzgerald
Commanding Officer



U.S. NAVAL AIR STATION
BRUNSWICK MAINE

Citizen RAB Co-Chair's Message

Dear Community Members,

As the Town of Brunswick representative to the Restoration Advisory Board, I, along with each representative from the Towns of Topsham and Harpswell and committed citizens are also members of the non-profit organization, the Brunswick Area Citizens for a Safe Environment (BACSE).

BACSE was formed to administer an EPA grant, the purpose of which is to ensure citizen involvement in the cleanup of Superfund sites. BACSE members serve without compensation and meet twenty to thirty times a year. Since the early 90s, BACSE has received more than \$300,000 in grants from the EPA to employ a professional environmental hydrologist who regularly attends meetings of the Restoration Advisory Board and advises BACSE members on technical issues. Ongoing monitoring of the contaminated sites is the basis for critical review by BACSE and its advocacy for the community to ensure optimum remediation goals, objectives and implementation.

The Curtis Memorial Library in Brunswick is the official depository for all transactions and documents generated in connection with this remediation project.

Our work does not incur any costs to state and town government.

Regarding our priorities for remediation, BACSE focuses on public health concerns and groundwater. The Eastern Plume has received the most attention over the years. Investigations during the late 1980's identified this area of groundwater contaminated by solvents. In the early 1990's, computer modeling indicated that this plume of polluted groundwater could start discharging to the Harpswell Cove estuary in as little as five years. As a result, the Navy installed a groundwater treatment system that is still operating today.

Recent investigations at the Eastern Plume have identified other "hot spots" (i.e., localized areas of elevated contaminant concentrations) as well as

(Continued on Page 2)

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new contaminants that were not being adequately remediated by the treatment system. The Navy recently initiated plans to improve treatment. During an assessment conducted in the 1990's, it was estimated that it could take between 20 to 70 years to reach cleanup goals and restore the aquifer to federal drinking water standards.

There are also several other identified areas with groundwater contamination at NAS Brunswick. The site of the former aviation fuel tanks contains petroleum-contaminated groundwater that is migrating slowly toward the south. Gasoline leaks at the NEX gas station, produced contaminated soil and a plume of dissolved gasoline-related chemicals in the groundwater. A soil removal action is being initiated in Summer 2009. The materials buried in landfills at Sites 1, 2, and 3 still have the potential to leach into groundwater and are monitored on a routine basis. In addition, there are locations where groundwater contamination is possible. An example is the Quarry Site in the western portion of the base that is being evaluated under the Navy's Military Munitions Response Program. Research and the preliminary assessment indicate potential for soil and groundwater contamination leading to the field investigations to be conducted.

Addressing issues of groundwater contamination is important because protecting the public health is not limited to merely preventing use of the groundwater. The depth to groundwater (to the water table) varies around the base, but in some places is shallow enough that excavation might end up with water in the bottom. If this water contains contaminants, then workers at the excavation site could be exposed to the chemicals by exposure to water or even vapors from this source. The Navy is actively working with all stakeholders to address these issues and BACSE will continue to provide oversight of these efforts.

Sincerely,
Suzanne Johnson

Eastern Plume Remedy Optimization Review

Tiger Team Meeting

A "Tiger Team" group was established which includes Navy personnel with expertise in remedial system evaluations and treatment optimization of environmental restoration remedies. On 2-3 June 2009, the Navy Tiger Team assembled along with other Navy representatives, Restoration Advisory Board members, and Navy contractors in Brunswick, Maine to discuss treatment optimization for the Eastern Plume Operable Unit. The Tiger Team

participants included professionals in the field of chemistry, microbiology, 1,4-dioxane treatment, risk assessment, environmental and chemical engineering, hydrogeology, groundwater modeling and remediation. During the two-day meeting, several technical presentations and key documents were presented and reviewed, covering multiple aspects of the complex hydrogeologic conditions at the Eastern Plume and the operation and effectiveness of the current treatment system. The Tiger Team meeting objectives were to gain a detailed understanding of the site conceptual model (i.e., contaminant receptors, pathways and contaminants of concern) as well as the system design basis and operation objectives for the pump and treat system including the extraction well network and the treatment equipment. Figure 1 (below) shows well network.

The Tiger Team will conduct an independent review of the current remedy using their understanding of the existing site conditions, stakeholder concerns, and remedial action objectives. Recommendations will then be developed for the Tiger Team's optimization plan which will be provided to the Navy in September 2009 providing an important proactive step towards operation and maintaining a cost-effective and protective remedy. The Team will present short-term and long-term potential alternative technologies and strategies that may be considered, as well as the need to ultimately develop an appropriate site exit strategy for the Eastern Plume.

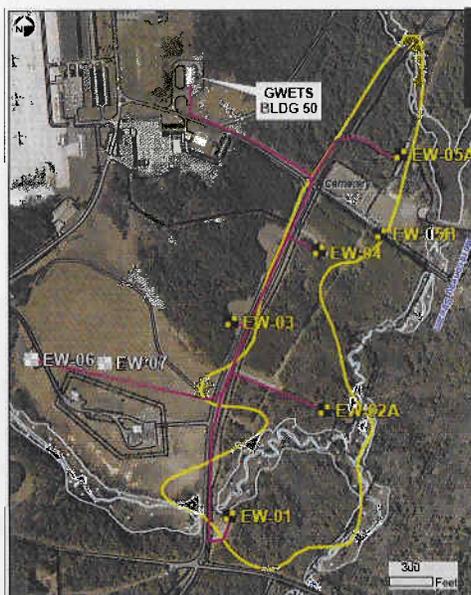


Figure 1. Existing Eastern Plume Extraction and Extend of Plume

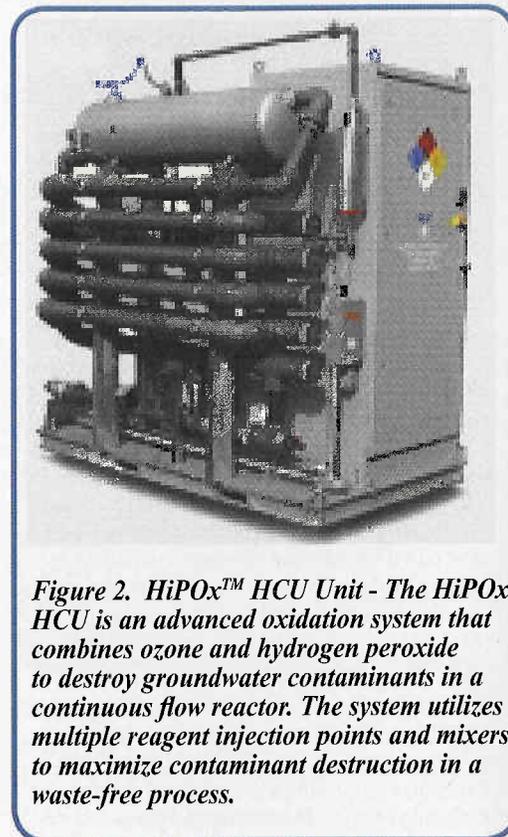


Figure 2. HiPOx™ HCU Unit - The HiPOx HCU is an advanced oxidation system that combines ozone and hydrogen peroxide to destroy groundwater contaminants in a continuous flow reactor. The system utilizes multiple reagent injection points and mixers to maximize contaminant destruction in a waste-free process.

Groundwater Flow Model – Tool for Assessment of Effectiveness of Groundwater Extraction and Treatment System

The Navy completed a groundwater flow model for the Eastern Plume and Sites 1 and 3 Landfills at Naval Air Station Brunswick in support of ongoing groundwater treatment system operations and improvements related to these two sites. A Technical Memorandum was prepared to complete the objectives stated in the *Final Groundwater Modeling Work Plan* (EA 2006). The groundwater model for the Eastern Plume is being used as a tool for further assessing the effectiveness of the existing extraction well network and for evaluating modifications to the existing system to increase mass removal and reduce offsite contaminant migration. The Tiger Team is currently in the process of assessing the groundwater model and the operation of the existing treatment system to determine viable alternative modifications to optimize the groundwater extraction and treatment system.

To read more about the conclusions and recommendations of the Technical Memorandum see "Draft Technical Memorandum: Evaluation of Eastern Plume Extraction Well Network and Sites 1 and 3 Remedy", ECC May 2009.

Emerging Contaminant 1,4-Dioxane Remedial Investigation Effort

The Navy performed an investigation in the area of Eastern Plume to further delineate and determine the extent of 1,4-dioxane in groundwater. Several transects were completed across the Plume where groundwater data was collected and used to locate the best location for additional permanent monitoring wells. A total of 9 additional monitoring wells were installed at the Eastern Plume in May 2009 and sampled in June. The results of this investigation will be provided in the Remedial Investigation Summary Report planned to be issued in September 2009. The subsurface data collected at the Eastern Plume as part of the 1,4-Dioxane remedial investigation were also incorporated into the groundwater flow model and the model was subsequently re-calibrated using this more recent data.

HiPOx™ Pilot Study

A pilot study is planned to be conducted in late Summer 2009 at the Naval Air Station Brunswick groundwater extraction and treatment system at Building 50 which currently treats contaminated groundwater in the Eastern Plume Operable Unit. Currently, the treatment train provides treatment of volatile organic compounds (VOCs) which enter the system from four extraction wells (EW-01, EW-2A, EW-04 and EW-5A). Groundwater extracted from these wells also contains 1,4-dioxane, although the individual and composite concentrations are consistently less than the discharge criteria. However, once extraction well EW-5B is placed on line, the system will need to accommodate and treat higher levels of 1,4-dioxane. Therefore, the Navy has developed a pilot study to use

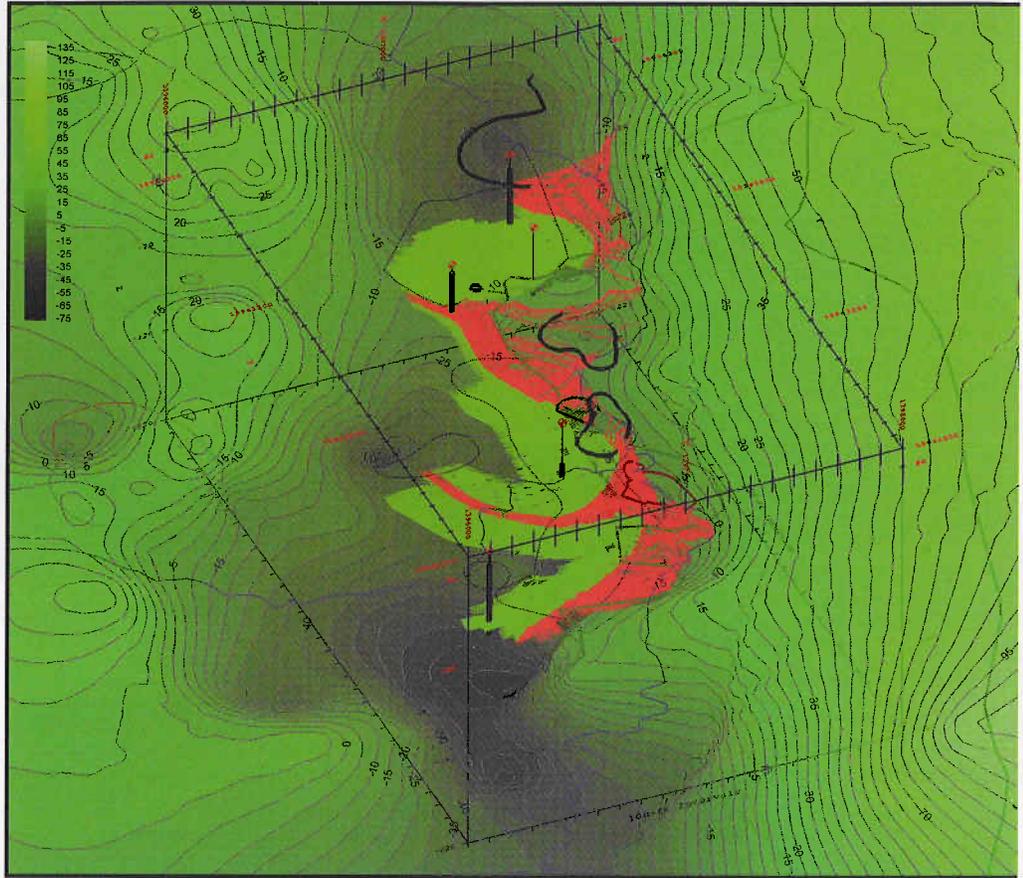


Figure 4. Eastern Plume Proposed Alternative Pumping Regime - 3-D Image of Eastern Plume generated from the groundwater model showing top of clay surface and existing extraction system. Red areas represent discharge to surface water and green areas represent plume capture by well.

a HiPOx™ HCU system to treat VOCs and 1,4-dioxane in groundwater. HiPOx™ is a patented advanced oxidation technology that uses hydrogen peroxide and ozone to create hydroxyl radicals for destruction of VOCs and 1,4-dioxane to carbon dioxide, water, and other innocuous byproducts. The application of this technology at Brunswick is projected to reduce the 1,4-dioxane concentrations in the effluent significantly below the regulatory criteria prior to discharge into the onsite infiltration gallery. This treatment system will be one of the options evaluated as part of the Tiger Team assessment of treatment alternatives and strategies. See Figures 2 and 3.

Proposed Modification to the Eastern Plume Extraction Well Network

Based on the groundwater flow model of the Eastern Plume and the known distribution of contaminants, it has been recommended that the existing groundwater extraction system be modified to provide effective plume capture. Two additional extraction wells will be added to the network in order to increase contaminant mass removal and minimize contaminant discharge to Mere Brook and Merriconeag Stream along the east side of the plume (see Figure 4 above). This modification is currently under consideration by the project stakeholders. The Tiger Team is further developing alternative remedial strategies to be considered by the Navy, EPA, and MEDEP, to further optimize the remedy and to begin to develop a long-term remedy for the site resulting in attainment of the site remedial action objectives and ultimately site closure.

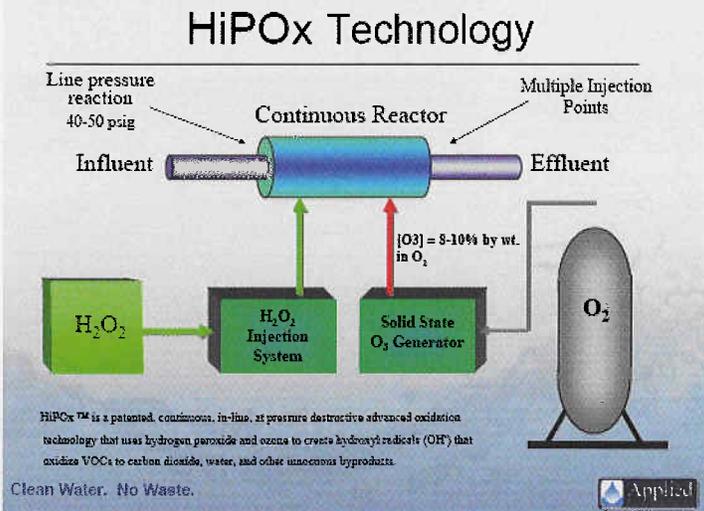


Figure 3. HIPOx™ system will be used at Eastern Plume to treat volatile organic compounds and 1,4-dioxane in groundwater.

Naval Exchange Service Station Removal Action

In support of the clean-up effort at the Naval Exchange (NEX) Service Station site, the Navy had completed a site delineation study in the Fall of 2008. Based on this site delineation study and previous investigations, the horizontal and vertical limits of gasoline range organic contamination at the NEX site have been determined. Soil excavation and clean-up action will begin in September 2009.

In general, the clean-up will include:

- Removal of three 10,000-gallon underground storage tanks and associated piping,
- Removal of pump island and canopy,
- Excavation of petroleum-contaminated soil,
- Dewatering of groundwater within the excavation area,
- Collection of confirmation samples from the sidewalls and bottom of the excavation,
- Transportation and proper disposal of petroleum contaminated soil, water and/or free product, if encountered,
- Backfilling excavation and site restoration,
- Groundwater monitoring.

A Remedial Action Work Plan (RAWP) for this clean-up effort is being prepared by the Navy and is expected to be issued to the regulators by the end of July 2009. The RAWP will include details of the excavation support, utility relocation plan, traffic control plan, groundwater dewatering plan, waste management plan, sampling and analysis plan,

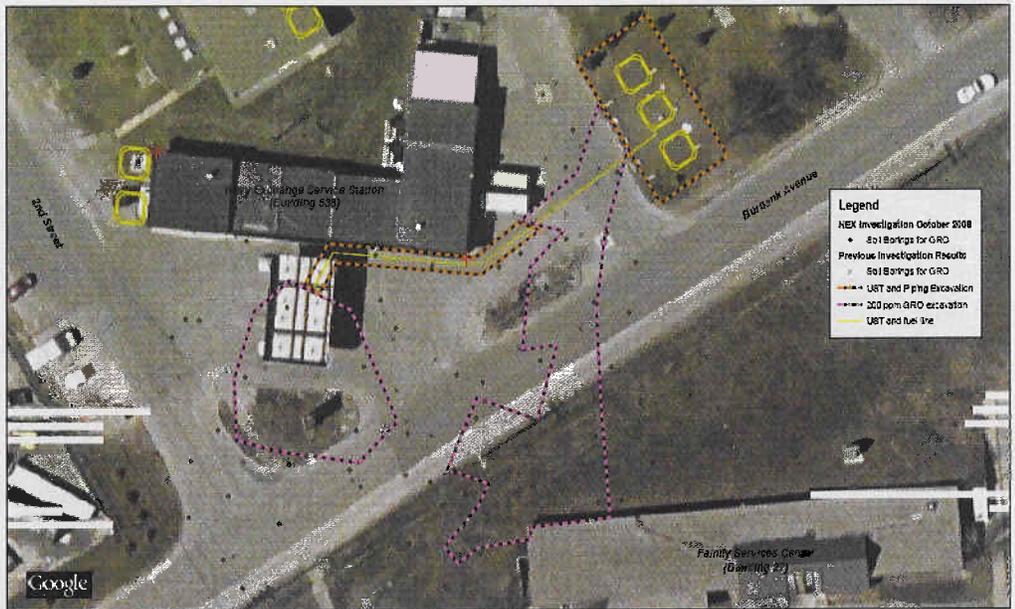


Figure 1 – Limits of excavation at Naval Exchange Service Station.

quality control plan, and health and safety plan. Figure 1 (above) shows the limits of excavation for gasoline range organic contamination in soil at the NEX Site based on the site delineation study conducted in Fall 2008 and previous investigations. Most of the contamination lies at or near the top of groundwater. Post excavation confirmation samples will be collected to ensure cleanup goals have been met.

Figure 2 (below) is a geologic cross-section showing the distribution of gasoline range organic contamination in groundwater at the NEX Site. Previous investigations have identified two groundwater plumes are present beneath the

site. These two areas are associated with the underground storage tank area and service station island area. Gasoline range organic compound concentrations have decreased significantly over time in the underground storage tank area plume, while gasoline range organic compound concentrations within the gasoline island area plume remained similar to reported historical results. Two additional rounds of groundwater sampling will be performed to evaluate the groundwater conditions after the completion of soil removal action.

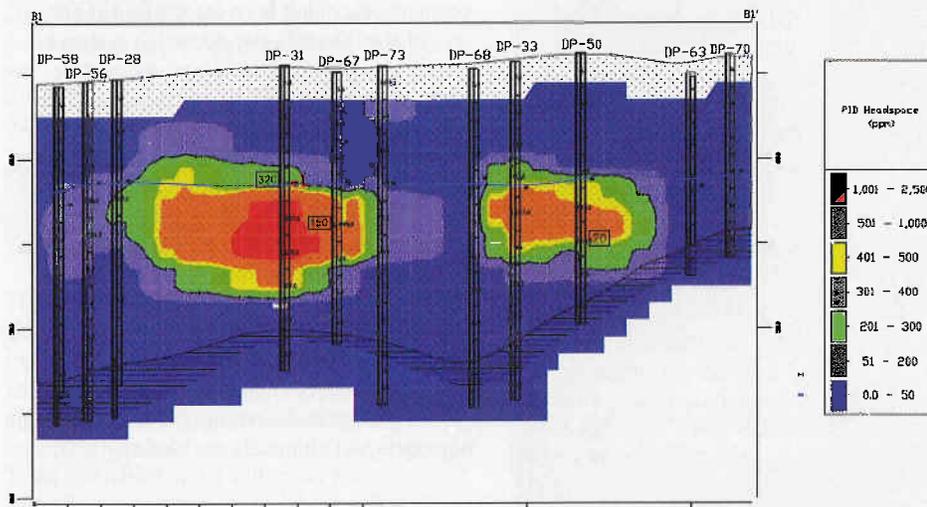
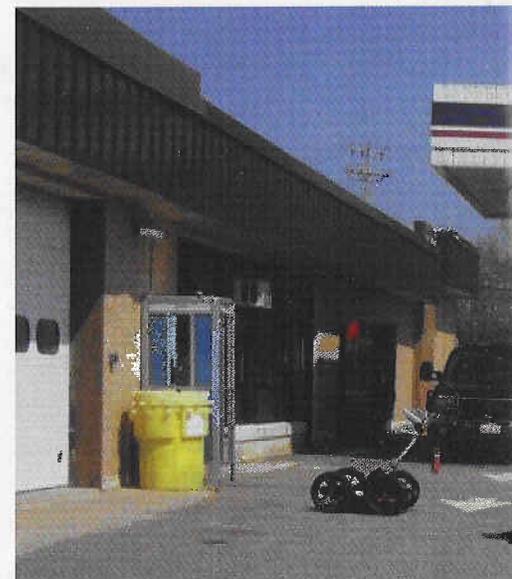


Figure 2 – Geological Cross-section beneath the Naval Exchange Service Station.



Education Corner – The 3rd Five-Year Review

Since being listed on the EPA's National Priorities List in 1987, Naval Air Station Brunswick has accomplished two CERCLA five-year reviews; First Five-Year Review Report (March 2000) and Second Five-Year Review Report (September 2005). The next five-year review for Naval Air Station Brunswick will be initiated during Fall 2009 and will be completed by September 2010.



What is a Five-Year Review?

In accordance with Section 121(c) of Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), a five-year review is required if a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at levels that do not allow for unlimited use and unrestricted exposure. For example, if the site is restricted to industrial use or containment remedy is in place at the site, the five-year reviews will need to be conducted. For the Naval Air Station Brunswick, five-year review process is conducted for the Installation Restoration (IR) Program sites.

What is the Purpose of a Five-Year Review?

The purpose of the five-year review is to evaluate the performance of the implemented remedy to verify that the remedy remains protective of human health and the environment, as stated in the Record of Decision (ROD) and Decision Documents

(DD). The existing remedy may be modified if it is no longer protective of human health and the environment. Although Navy policy requires continual evaluation and optimization of remedies, the project stakeholders should take advantage of opportunities presented by the five-year review process to discover, recommend, and implement optimization strategies for all ongoing projects.

What Should Be Included in a Five-Year Review Report?

The five-year review report should present a brief description of the site, the results of the five-year review, and recommendations. This report should consider and/or contain the following:

- Whether the remedy currently is or is expected to be protective;
- Document any deficiencies identified during the review;
- Recommend specific actions to ensure that a remedy will be or will continue to be protective;

- Where necessary, include a description of follow-up actions and a timetable needed to achieve or to continue to ensure protectiveness;
- For sites that are still in the remedial action phase, the remedy evaluation and optimization are performed routinely and most information for the five-year review report should be readily available;
- In conducting a five-year review, the effect of any newly promulgated or modified standards on the protectiveness of the remedy originally selected in the ROD/DD should be determined;
- When the five-year review indicates that the remedy is not performing as designed, the report should recommend actions to improve performance; and,
- Where a site is in the Remedial Action phase, a five-year review should confirm that immediate threats have been addressed and that the remedy will be protective when complete.

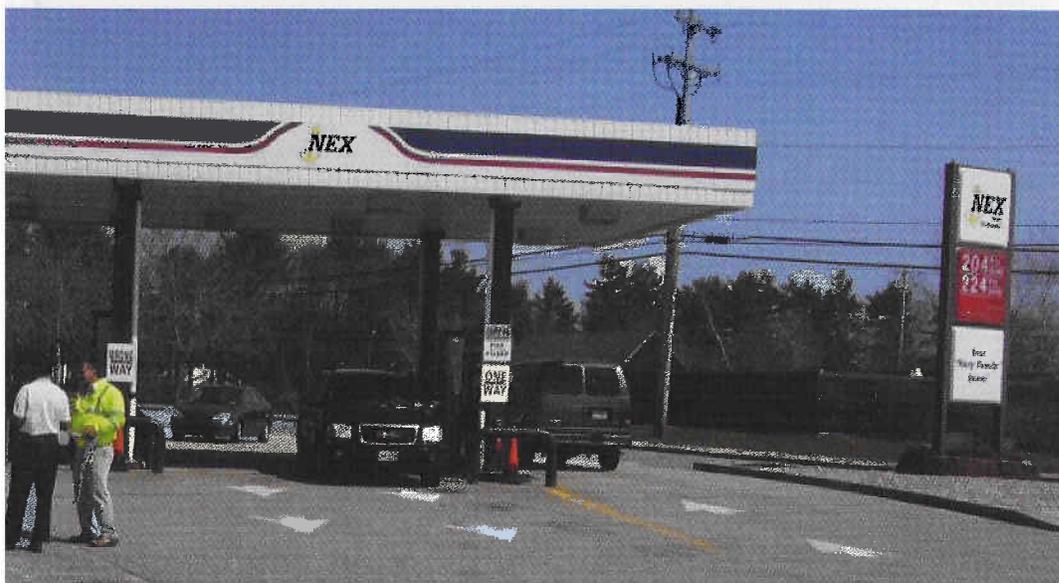
For More Information:

The *Comprehensive Five-Year Review Guidance*, OSWER Directive 9355.7-03B-P, dated June 2001, is intended to promote consistent implementation of the five-year review process.

This document is located at:

<http://www.epa.gov/superfund/accomp/5year/index.htm>

Subsurface utilities beneath the gas station have been marked prior to subsurface investigation activities. Several underground utilities (such as storm sewer, sanitary sewer, water main, gas line, etc.) are present in the vicinity of the site and some of these utilities will require permanent relocation while others will require temporary re-routing to facilitate the planned soil removal action.



Summer 2009 Field Work Update

Site 7 – Site Investigation

A total of 28 soil borings and 6 existing monitoring wells were sampled during April 2009 to determine the source of elevated metals (manganese and cadmium) in groundwater at Site 7. The results will be presented in a draft report scheduled for late summer 2009.

Sites 17 Soil Removal

The removal action at the southern end of Site 17 was completed in July 2009. Approximately 53 cubic yards of pesticide contaminated soil was excavated from the area across Avenue

B. The soil had been originally relocated from the Building 95 Pesticide Storage Area to this area south of Avenue B in October 1994.

Extraction Well EW-05B Piping Installation

Construction began in July 2009 for the installation of the piping to connect extraction well EW-05B to the Groundwater Extraction and Treatment System. The electrical systems and concrete well vault were also installed in July in order to place the extraction well on-line.

Background Study Sampling

Groundwater and soil sampling at designated locations will be conducted in summer 2009 to be used in the Background Study Assessment. One round of soil sampling and two rounds of groundwater, surface water, and sediment sampling are planned. This data will be used to determine background concentrations in soil, surface water, sediment, and groundwater

for specified chemical constituents.

Military Munitions Response Program

Sampling has begun in early summer 2009 at the Munitions Constituents Areas of Concern in order to further assess the impacts at the following areas:

- Topsham Skeet Range
- Machine Gun Boresight Range
- NAS Brunswick Skeet Range

Naval Exchange Service Station Removal Action

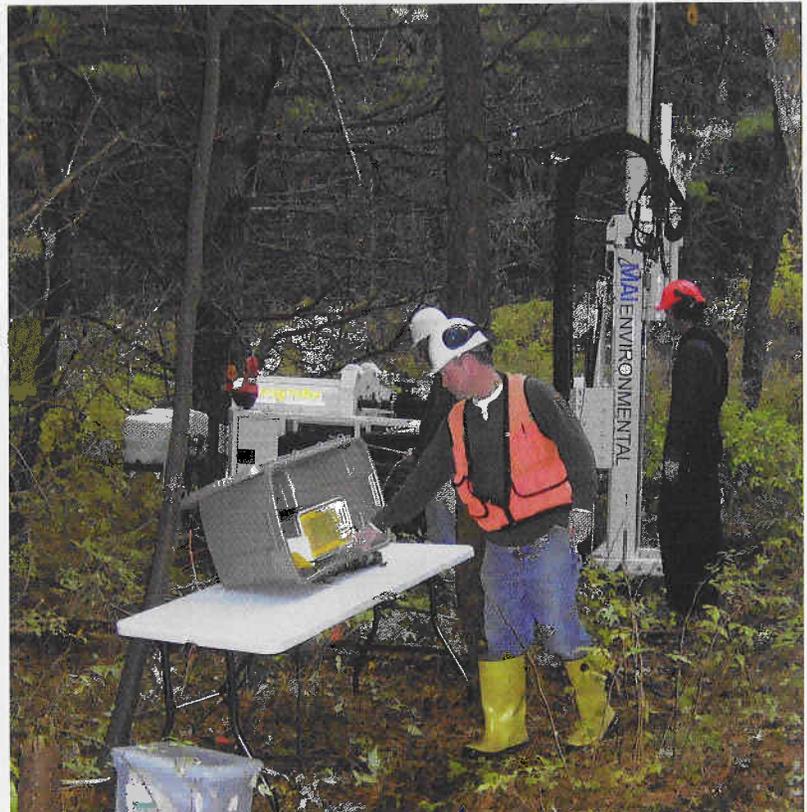
Based on the previous investigations conducted to define the horizontal and vertical limits of petroleum-related contamination at the NEX Service Station, a soil removal action will be conducted in the fall 2009. This remedial action and final site restoration are planned to be completed by the end of November 2009.



Photo of Site 7 showing soil sampling tent and Geoprobe®. Use of X-Ray Fluorescence (XRF) as a screening tool for metals in soils.



Track mounted drill rig used for the installation of bedrock wells at the Eastern Plume.



Field geologist operating an electrical conductivity recording unit which provides data on soil characteristics from a probe advanced by a Geoprobe® drill rig.

Emerging Compound 1,4-Dioxane Remedial Investigation Monitoring Well Installation

A total of 12 new monitoring wells were installed within identified data gap areas at the Eastern Plume in order to delineate 1,4-dioxane in groundwater. These new wells were sampled in June 2009 and the results will be summarized in a Supplemental Remedial Investigation Report scheduled for late summer 2009.

Bedrock Investigation

A total of 9 new monitoring wells were installed in the vicinity of a bedrock well (MW-308) where volatile organic compound were detected, in order to evaluate potential migration pathways for contaminants to enter the bedrock. The wells were installed in December 2008, and sampled in April 2009 at the time of long term monitoring program for the Eastern Plume. The results will be presented in the Supplemental Remedial Investigation Report for the Eastern Plume scheduled for late summer 2009.



Extraction Well EW-5B trench for piping and hook up of extraction well to existing system at the Eastern Plume. Photo taken on 17 July 2009.



Site 17 showing the planned excavation area at Site 17 along the south side of Avenue B (marked by orange pin flags). Plastic sheet to be used to stockpile excavated clean top soil. Photo taken on 6 July 2009.



Site 17 after the top 2 feet of clean top soil was removed and temporarily stockpiled beside the excavation. Photo shows site workers standing on the geomembrane which was originally placed on top of the pesticide-impacted relocated soils in October 1994 as a marker. This membrane was removed and approximately 9 inches of contaminated soil was removed and transported off-base for disposal.



Navy representatives discuss technical site issues with community at Restoration Advisory Board meeting for Naval Air Station Brunswick, Maine.

Environmental Cleanup Information and Public Participation

Environmental cleanup program activities began at NAS Brunswick in 1982. State and Federal regulatory agencies provide oversight and concurrence of work conducted, and the RAB provides valuable community input on the cleanup program. Your input is important for the success of the environmental cleanup program.

The NAS Brunswick Restoration Advisory Board consists of representatives from the state regulatory agencies, federal regulatory agencies, and the community who meet quarterly to provide feedback to the Navy on investigation and cleanup actions. All members of the public are welcome!

Please contact MC2. David Hewitt, who is the Public Affairs Officer for NAS Brunswick, if you have questions, or would like more information.

MC2. David Hewitt
Public Affairs Officer
Naval Air Station Brunswick
Brunswick, Maine
Phone (207) 921-2000
Email david.hewitt@navy.mil

Upcoming Restoration Advisory Board Meetings

The Restoration Advisory Board (RAB) consists of representatives of the community as well as State and Federal regulators, who advise the Navy on environmental cleanup issues and strategies for Naval Air Station Brunswick. These meetings are public and you are invited to attend to learn more about the Navy's environmental cleanup activities at NAS Brunswick.

The RAB Meetings are held in the evenings from 7:00 PM to 9:00 PM, within the Town of Brunswick at various locations. The RAB Meeting location is published in the Brunswick Times Record in advance of each NAS Brunswick RAB meeting.

2009 Restoration Advisory Board Meetings

- 12 August 2009, Wednesday
- 4 November 2009, Wednesday

Information Repository

For over 15 years, the Navy has maintained an information repository (i.e. Administrative Record) for the NAS Brunswick that contains project documents and other reference materials related to the investigation and cleanup program for the Base. The repository is updated periodically as new information becomes available.

Curtis Memorial Library

23 Pleasant Street
Brunswick, Maine 04011
(207) 725-5242

www.curtislibrary.com

Hours:

Mon – Thursday, 9:30 AM to 8:00 PM
Friday, 9:30 AM to 6:00 PM
Saturday, 9:30 AM to 5:00 PM (Jun – Aug until 1:00 PM)
Sunday, 12:00 PM to 4:00 PM (Jun – Aug - closed)

Website Links

- Naval Air Station Brunswick – <http://www.cnic.navy.mil/brunswick>
- NAS Brunswick Environmental Cleanup Program Website – <http://nasbrunswick.navy-env.com/>
- Navy's BRAC Program Management Office (PMO) – <http://www.bracpmo.navy.mil/>
- DoD Base Realignment and Redevelopment Manual – http://www.dod.mil/brac/pdf/4165-66-M_BRRM.pdf
- US DoD Base Realignment and Closure 2005 Website – <http://www.defenselink.mil/brac/index.html>
- Midcoast Regional Redevelopment Authority – <http://www.mrra.us/>
- Brunswick Area Citizens for a Safe Environment – <http://www.curtislibrary.com/BACSE/>



Aerial View of Naval Air Station Brunswick, Maine