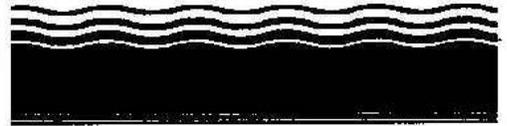




Naval Air Station NORTH ISLAND

SITE
SUPERFUND INNOVATIVE
TECHNOLOGY EVALUATION



This fact sheet will tell you about:

- The SITE demonstration of the Zenon cross-flow pervaporation system scheduled to occur in October and November 1994 at NAS North Island, Site 9.
- A public Visitors' Day for the SITE demonstration, which is scheduled for November 2, 1994. To attend the Visitors' Day, complete the enclosed registration forms.
- How you can obtain more information and become involved in cleanup activities at NAS North Island.

Public Meeting

NAS North Island Restoration Advisory Board (RAB)
Wednesday, October 19 - 6:30 p.m.
Coronado Public Library, Winn Room
640 Orange Avenue
Coronado, CA 92118

Meeting Agenda Items:

- Site 1 Shoreline Sediments Work Plan
- Discussion of RAB operating procedures
- Application Process for Community Co-Chair Election

This meeting is open to the public and anyone interested in learning more about the environmental cleanup program underway at NAS North Island is encouraged to attend. (For more information on the Board see "Restoration Advisory Board" on this page.)

Fact Sheet No. 4

October 1994

Introduction

On October 28, 1993, the Secretary of the Navy designated Naval Air Station (NAS) North Island as one of two Naval Environmental Leadership Program (NELP) facilities. The objective of NELP is to demonstrate innovative cleanup, conservation, compliance, and pollution prevention technologies, and to model focused management techniques in the environmental arena. The NELP initiatives will lead the Navy and Marine Corps environmental programs. NAS North Island is coordinating demonstrations with community members, regulators, corporations, academia, and other federal agencies.

The NELP initiative seeks to conduct demonstrations such as the Zenon Environmental, Inc. (Zenon), cross-flow pervaporation system highlighted in this fact sheet. These types of demonstrations help prove out innovative systems before initiating larger and more complex cleanup operations. NELP provides the Navy a platform to demonstrate, publicize, and export innovative technologies throughout the Navy in a more expeditious and cost effective manner.

Restoration Advisory Board

To increase public involvement in the environmental cleanup program, NAS North Island formed a Restoration Advisory Board (RAB). The Board serves as a public forum for discussion and exchange of information related to the ongoing cleanup efforts of the Navy's Installation Restoration Program. It provides opportunity for the

community to review cleanup progress, provide input, and participate in a dialogue with decision makers. At NAS North Island, the Installation Restoration Program focuses on the cleanup of contamination from past hazardous waste operations and disposal practices at 12 sites and protecting public health.

The Board is comprised of community members, Navy officials, and state and local environmental regulators. The Board was formed to bring together community members who reflect the diverse interests within the local community and to enhance two-way flow of information and concerns between the community and the Navy. Members of the Board have the unique opportunity to provide advice and ideas directly to government decision makers. Currently, 11 representatives from the community are Board members. Citizens interested in serving on the Board may obtain an application by calling Lieutenant Bob Walker or Mr. Ken Mitchell, NAS North Island Public Affairs Office at (619) 545-8167. Applications received through October 31, 1994 will still be considered for membership.

EPA's SITE Program

The U.S. Environmental Protection Agency (EPA) identifies new methods for hazardous waste cleanup through its Superfund Innovative Technology Evaluation (SITE) Program. Created in 1986, this program demonstrates and evaluates innovative treatment technologies that may significantly reduce the toxicity, mobility, or volume of hazardous waste. Each year, EPA solicits proposals from private technology developers to demonstrate innovative technologies under

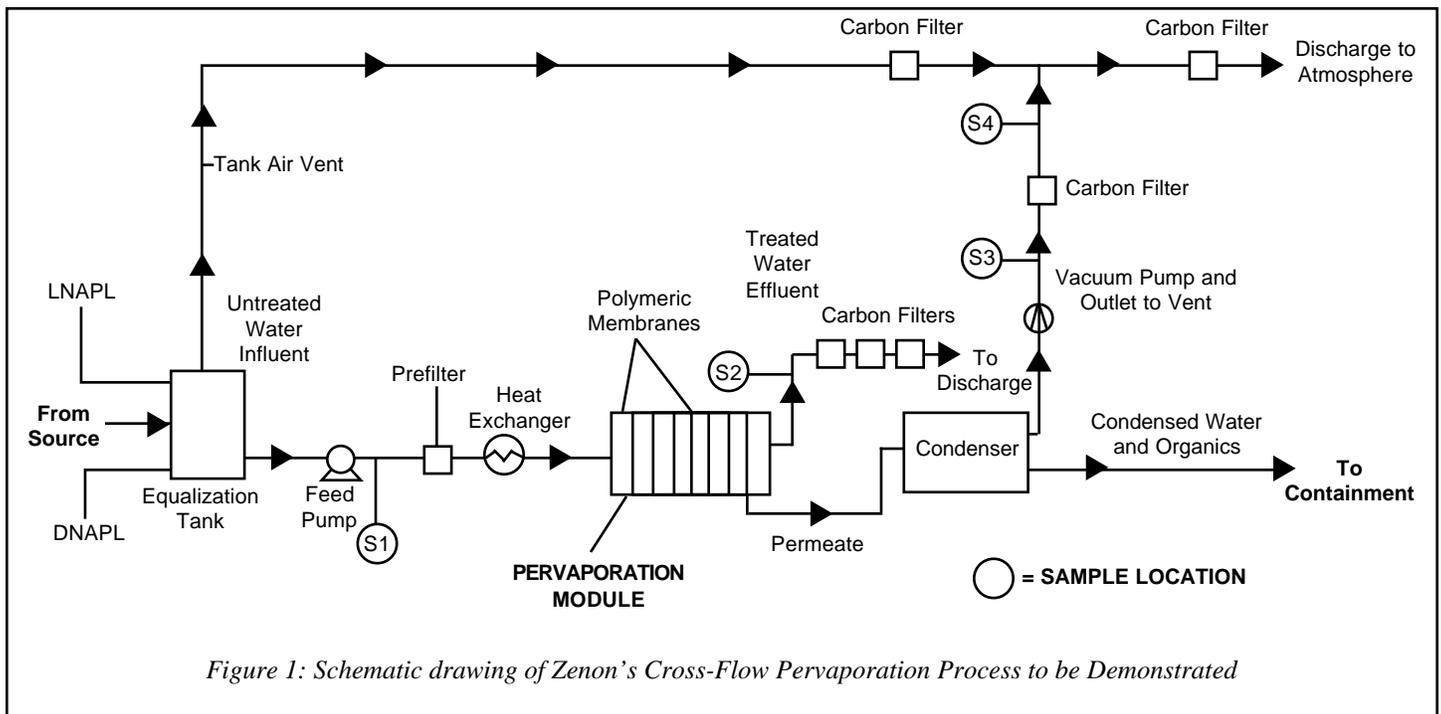


Figure 1: Schematic drawing of Zenon's Cross-Flow Pervaporation Process to be Demonstrated

the SITE Program. The SITE Program also generates reliable performance and cost information on the technologies for use in evaluating cleanup alternatives for similarly contaminated sites. Because NELP and the SITE Program have similar goals, the two programs combined their efforts to demonstrate the Zenon cross-flow pervaporation system.

The cross-flow pervaporation system was developed by Zenon Environmental Systems, Inc., of Burlington, Ontario, Canada. The purpose of the demonstration is to determine the system's effectiveness in removing various volatile organic compounds (VOC) from groundwater at NAS North Island Site 9. In October 1993, a pilot-scale cross-flow pervaporation system successfully treated contaminated groundwater at a petroleum pumping station site in Burlington, Ontario. In December 1993, contaminated groundwater from Site 9 was treated in a bench-scale test at Zenon's laboratory in Ontario. The treated water exiting the system met all removal requirements. The SITE demonstration at Site 9 will evaluate the Zenon system under field operating conditions.

Technology Description

Pervaporation is a membrane process that removes organic compounds from aqueous matrices. The Zenon cross-flow pervaporation system is designed to remove VOCs; however, many semi-volatile organic compounds (SVOC) may also be removed during system operation.

In the Zenon pervaporation system, organic-contaminated water is pumped from an equalization tank at flow rates ranging from 2 to 15 gallons per minute (gpm). The water first passes through a 200-micron prefilter to remove debris and silt particles, and then enters a heat exchanger where its temperature is raised to approximately 75° C (see Figure 1). The heated, contaminated water then flows into a pervaporation module containing dense, polymeric membranes. These membranes separate organics from the contaminated water as it passes through the pervaporation module. The treated water then exits the system.

Organic vapor and small amounts of water extracted from the contaminated water are called permeate. As the permeate exits the pervaporation module, it is drawn into a condenser by a vacuum, where organics are condensed to a liquid. The permeate liquid then flows to a collection tank. Because emissions are vented from the system down-

stream of the permeate condenser, organics in the vacuum pump outlet are minimized. VOCs which do escape the pervaporation module or condenser are captured by a series of carbon filters.

The permeate contains highly concentrated organic compounds and has a significantly reduced volume compared to the untreated water. Because of this high concentration, the permeate generally separates into aqueous and organic phases, making the organic fraction potentially recoverable. The concentrated organics are pumped from the collection tank to storage, and the collected water can either be returned to the pervaporation system for further treatment or removed for disposal.

Pervaporation provides an option to conventional air stripping or carbon adsorption technologies for treating organic-contaminated water. Unlike air stripping, pervaporation releases negligible amounts of volatile compounds to the outside air. Also, pervaporation has no treatment medium that requires replacement and disposal, such as activated carbon.

Site History

NAS North Island is located at the north end of the peninsula that forms the San Diego Bay and borders the city of Coronado in southern California. Officially commis-

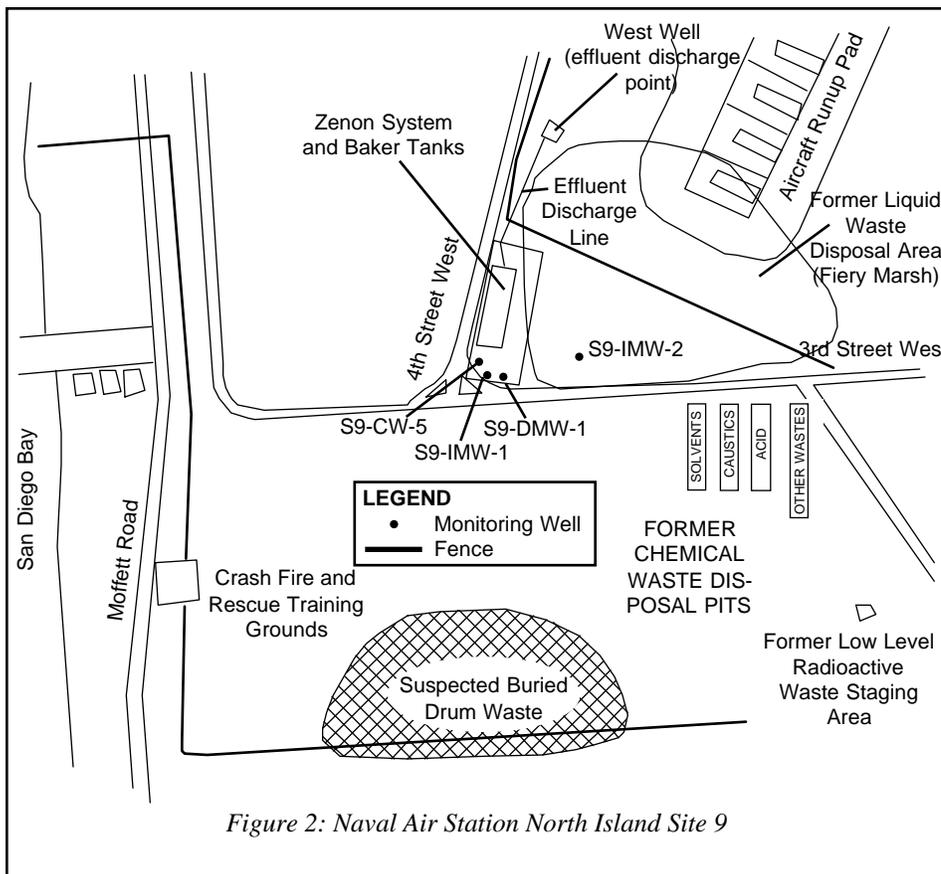


Figure 2: Naval Air Station North Island Site 9

sioned in 1917, NAS North Island is an active naval complex that supports naval aviation activities and units.

Environmental investigations are being conducted under the Installation Restoration Program at 12 sites on NAS North Island, one of which is Site 9. Site 9 is a 15-acre area located on the western end of NAS North Island. Wastes disposed of at Site 9 included waste acids, waste solvents, waste paint materials, electroplating wastes, and various petroleum hydrocarbons. Site 9 consists of three former waste disposal areas (see Figure 2). The first area is located directly north of 3rd Street West, where various liquid wastes were drained into a large, shallow pit from the 1940s or 1950s until 1968. Contamination from this area has migrated via groundwater to the surrounding area. The second area is located just south of 3rd Street West and consists of four parallel disposal pits. From an undetermined date until the mid-1970s, liquid wastes, including caustics, acids, and other hazardous materials, were segregated and disposed of in these trenches. Contamination has migrated from these trenches and entered underlying groundwater. The third area is located south of 3rd

Street West near the center of Site 9 and extends to its southern boundary. From the 1950s until 1978, unidentified drummed chemical waste was buried in this area. Contamination has migrated from this disposal area to the underlying groundwater. Site 9 also contains a former low-level radioactive materials staging area; however, no radioactive waste disposal has been documented near this area.

Contaminants found at elevated concentrations in the groundwater at Site 9 include trichloroethene (TCE), 2-butanone, vinyl chloride, methylene chloride, 4-methyl-2-pentanone, cis-1,2-dichloroethene, and total xylenes. The primary contaminant to be removed during the demonstration will be TCE.

Technology Demonstration

The Zenon cross-flow pervaporation system will be demonstrated over a 5-week period beginning in October 1994. About 100,000 gallons of groundwater will be treated during the demonstration. The primary objective of the demonstration is to evaluate the effectiveness of the Zenon cross-flow pervaporation system in removing VOCs from groundwater at Site 9. Data gathered throughout the demonstration will be used to calculate the Zenon system's removal efficiencies. Samples will be taken of the untreated groundwater, the treated groundwater, and the vapor exiting the system (see Figure 1).

Another objective of the SITE Program demonstration is to compare the system's removal efficiencies, operating costs, and volume of generated waste with conventional carbon adsorption technologies. In addition, the demonstration will document the system's operating parameters and the potential for system fouling at Site 9.

MAILING LIST

If you did not receive this fact sheet in the mail, then you are not on our mailing list. If you wish to be placed on the Naval Air Station, North Island site activity mailing list, please complete this form, detach, and mail to:

Ken Mitchell
Public Affairs Officer
Naval Air Station, North Island
Code OB
P.O. Box 357033
San Diego, CA 92135

Name _____
 Address _____
 City _____ State _____ Zip _____
 Phone (_____) _____
 Affiliation _____

The SITE Program has prepared a detailed quality assurance project plan (QAPP) outlining the methods and procedures for testing and evaluating the technology. When the demonstration is complete, EPA will prepare a brief bulletin, a 10-page technology capsule, and an Innovative Technology Evaluation Report detailing analytical results and possible applications of the technology. These reports are used to evaluate technologies as alternatives for cleaning up similar sites across the country.

Community Relations Program

This fact sheet is part of a continuing effort to keep the public informed of environmental cleanup activities occurring at NASNI. During the demonstration, the public is invited to attend a Visitors' Day scheduled for November 2, 1994. The Visitors' Day will enable the community to become familiar with the ongoing cleanup effort and will present more detailed information about the Zenon system and the SITE demonstration. To attend the Visitor's Day, complete the enclosed registration form. For additional forms, call Cindy Loney of PRC Environmental Management, Inc., at (513) 241-0149.

The basic goals of the NAS North Island Community Relations Program are to (1) inform the community about investigation and environmental cleanup activities occurring at NAS North Island, and (2) provide the community with opportunities to comment on these activities. To accomplish these goals,

community meetings and public comment periods are held at critical decision points in the cleanup process. These meetings and comment periods give the community an opportunity to review and comment on proposed cleanup alternatives before a decision is made. During a public comment period, concerns voiced by the community will be responded to in writing and summarized in a document called the Responsiveness Summary. The community is notified of meetings and comment periods through mailings, advertisements in local papers (including The North Islander), and announcements on local radio stations.

Additional Information

Questions or comments about the SITE Program demonstration should be forwarded to the EPA Project Manager, Ron Turner, by October 21, 1994. Specific questions regarding the NAS North Island Installation Restoration Program, NELP Initiative, the RAB, the demonstration site, or the technology should be directed to the following individuals:

Naval Air Station, North Island

For the Restoration Advisory Board:
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Naval Air Station North Island
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California Department of Toxic Substances Control

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U.S. Environmental Protection Agency

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Naval Air Station NORTH ISLAND



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