

Fact Sheet

Proposed Plan for Area B Groundwater



About Picatinny

Picatinny is a munitions research, development and engineering base owned and operated by the U.S. Army. Historically, the facility also was engaged in munitions manufacturing. The facility was a major source of munitions for World War I, World War II, the Korean War and the Vietnam Conflict. Picatinny is situated on 6,491 acres of land approximately four miles north of the Borough of Dover in Rockaway Township, Morris County, New Jersey.

The Army is proposing final cleanup actions for **groundwater** in Area B, the location of a former landfill and **pyrotechnic** testing area near the southwestern boundary of Picatinny. The work will involve improving groundwater quality through **enhanced bioremediation** and continuing land-use restrictions until groundwater quality meets cleanup standards.

The Army developed the **Proposed Plan** for Area B groundwater in consultation with the **U.S. Environmental Protection Agency (USEPA)** and **New Jersey Department of Environmental Protection (NJDEP)**. The plan meets federal regulations under the **Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, or Superfund)**.

The Army is making the Proposed Plan available for public comment so that the community may participate with the USEPA, NJDEP and Army at Picatinny to determine the acceptability of conducting this cleanup action. This fact sheet provides a summary of the Proposed Plan and specific guidance on how the public can participate in the final selection of the remedy for the site.

Historical Background and Site Description

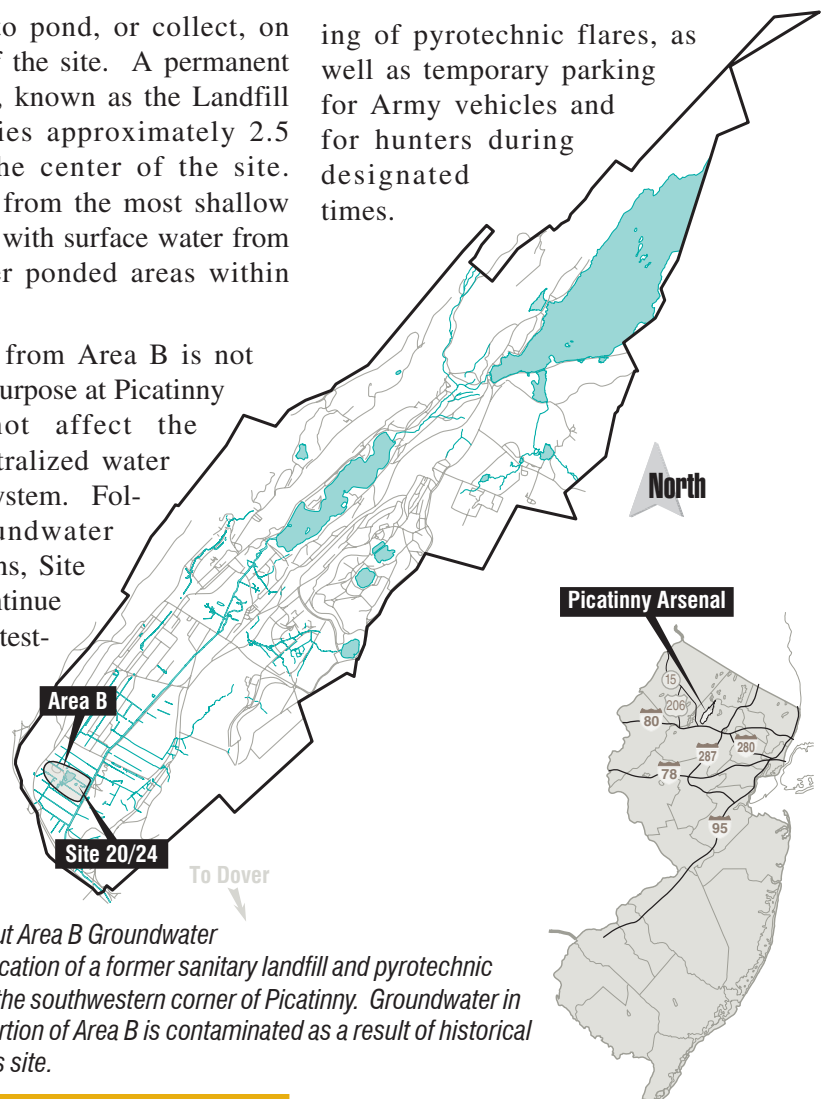
Groundwater addressed under this action lies underneath Area B, located near the southwestern boundary of Picatinny. The area is approximately 28 acres in size and includes two study sites—Site 24, a former sanitary landfill, and Site 20, an area within Site 24 where flares and signal devices have been tested. At one time, activities in Area B included the temporary staging of waste **solvents** destined for disposal at off-site facilities. Containers storing the solvents are believed to have leaked directly onto the ground, resulting in solvent compounds entering the groundwater. Figure 1 shows the location of Area B within Picatinny and Figure 2 shows the boundaries and features of Site 20/24.

Groundwater in Area B exists in four different layers, or **aquifers**, at varying depths under the site. The overall direction of groundwater flow is southeast in the direction of Green Pond Brook. Because Site 20/24 is situated on a former wetland area that was filled in during development,

water tends to pond, or collect, on some areas of the site. A permanent shallow pond, known as the Landfill Pond, occupies approximately 2.5 acres near the center of the site. Groundwater from the most shallow aquifer mixes with surface water from this and other ponded areas within Area B.

Groundwater from Area B is not used for any purpose at Picatinny and does not affect the arsenal's centralized water distribution system. Following groundwater cleanup actions, Site 20/24 will continue to be used for test-

ing of pyrotechnic flares, as well as temporary parking for Army vehicles and for hunters during designated times.



*Figure 1 – About Area B Groundwater
Area B is the location of a former sanitary landfill and pyrotechnic testing area in the southwestern corner of Picatinny. Groundwater in the western portion of Area B is contaminated as a result of historical activities at this site.*

Previous Environmental Studies and Response Actions

Information on environmental conditions at Picatinny, including Site 20/24, was collected from a variety of studies between 1981 and 2002. The studies showed that both groundwater and soil in Area B were impacted by former landfilling and pyrotechnic testing activities. Groundwater was determined to be affected by various solvent compounds. Contaminated soil was managed under a separate action.

Studies Show Main Impacts Are in the Western Part of Site 20/24

Studies have shown that groundwater contamination lies principally in the western third of Site 20/24 in three separate **plumes**. The depth and width of the plumes vary depending on factors such as the location of the origi-

nal source of contamination and mobility and breakdown patterns of the chemicals.

The largest plume, which covers the most northwestern segment of the site, contains the volatile organic com-

Soil Cover Helps Prevent Further Impacts to Groundwater

Cleanup of contaminated soil at Site 20/24 was managed under a separate action between July 2002 and August 2003. To prevent contact with impacted soil and to reduce the potential for additional groundwater impacts, Picatinny covered the contaminated soil with a cap of clean soil and vegetation. Additional testing was performed to ensure that soil underneath the cap was not affecting groundwater. The cap is inspected annually to ensure it remains intact.

pounds (**VOCs**) **trichloroethylene (TCE)**, **dichloroethylene (DCE)** and **vinyl chloride (VC)** in concentrations above levels of concern. A smaller plume of **perchloroethylene (PCE)** is contained in the most southeastern boundary of the larger plume. The TCE, DCE, VC and PCE plumes are located within the area known as Region 1 (refer to Figure 3).

A third very small plume, containing the VOC **xylene**, is located in the southwestern border of Site 20/24. This area is referred to as Region 2 (refer to Figure 3).

Surface Water Contamination Limited to On-Site Pond Areas

Because shallow groundwater at the site is connected to water in ponded areas, surface water at the site also is contaminated with VOCs. The surface water contamination at the site is localized and has not travelled as far as Green Pond Brook; this has been con-

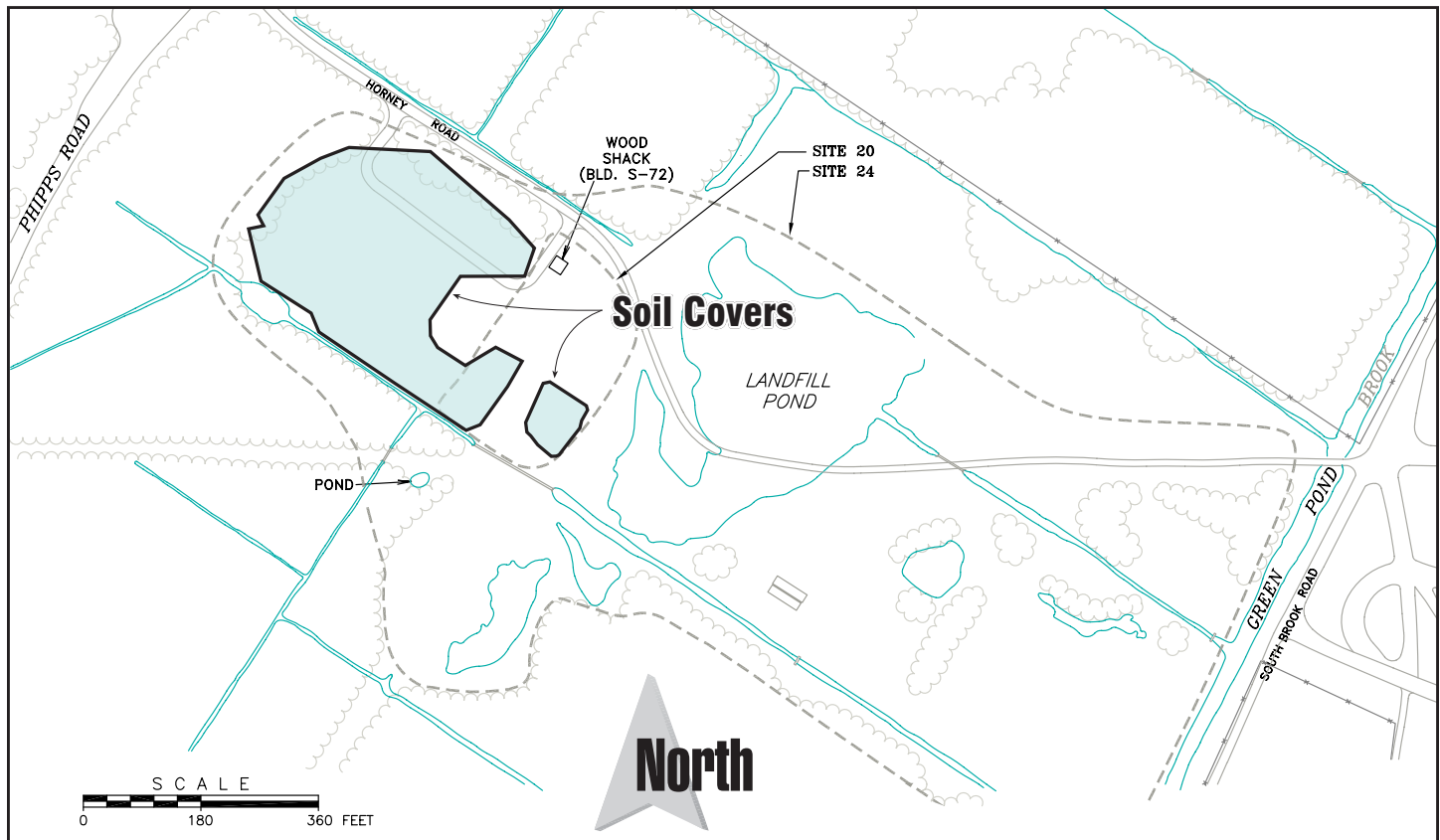


Figure 2 – Boundaries and Vicinity of Area B Groundwater (Site 20/24)

Area B includes study Site 20, an area formerly used to test flares and signal devices, and Site 24, a former sanitary landfill. Area B is approximately 28 acres in size. Earlier cleanup actions in Area B involved covering part of the site with clean soil and vegetation.

firmed by testing of Green Pond Brook where drainage ditches enter from Site 20/24 and at the arsenal boundary.

Risk Calculations Showed Site 20/24 is Safe for its Current Use

Calculated risks to human health from exposure to groundwater and surface water at Site 20/24 determined that groundwater and surface water do not pose a risk for current activities at the site. While groundwater is not used for drinking, risk calculations were performed considering future unrestricted use of the site. The evaluation determined that drinking of the groundwater from the site would pose

unacceptable risks to human health. However, groundwater from the site is not used for drinking and such use will be prohibited in the future.

The risk evaluation showed that risks to trespassers who might swim or fish at the site are within acceptable levels. (Fishing and swimming, however, are prohibited at the site and will remain prohibited in the future. Furthermore, access to the site is restricted by fencing and other means.)

Summary of Proposed Remedies

In evaluating the best approach for final cleanup of Area B groundwater, the Army developed six possible plans of action for Region 1, three possible

plans of action for Region 2, and one alternative action capable of cleaning up both regions together.

The cleanup options were designed to:

- Prevent exposure to contaminated Area B groundwater
- Protect uncontaminated groundwater and surface water
- Minimize migration of contaminants to nearby groundwater and surface water
- Restore contaminated groundwater and surface water for future use
- Comply with federal, state and Picatinny groundwater and surface water standards

Each of the options (except taking no

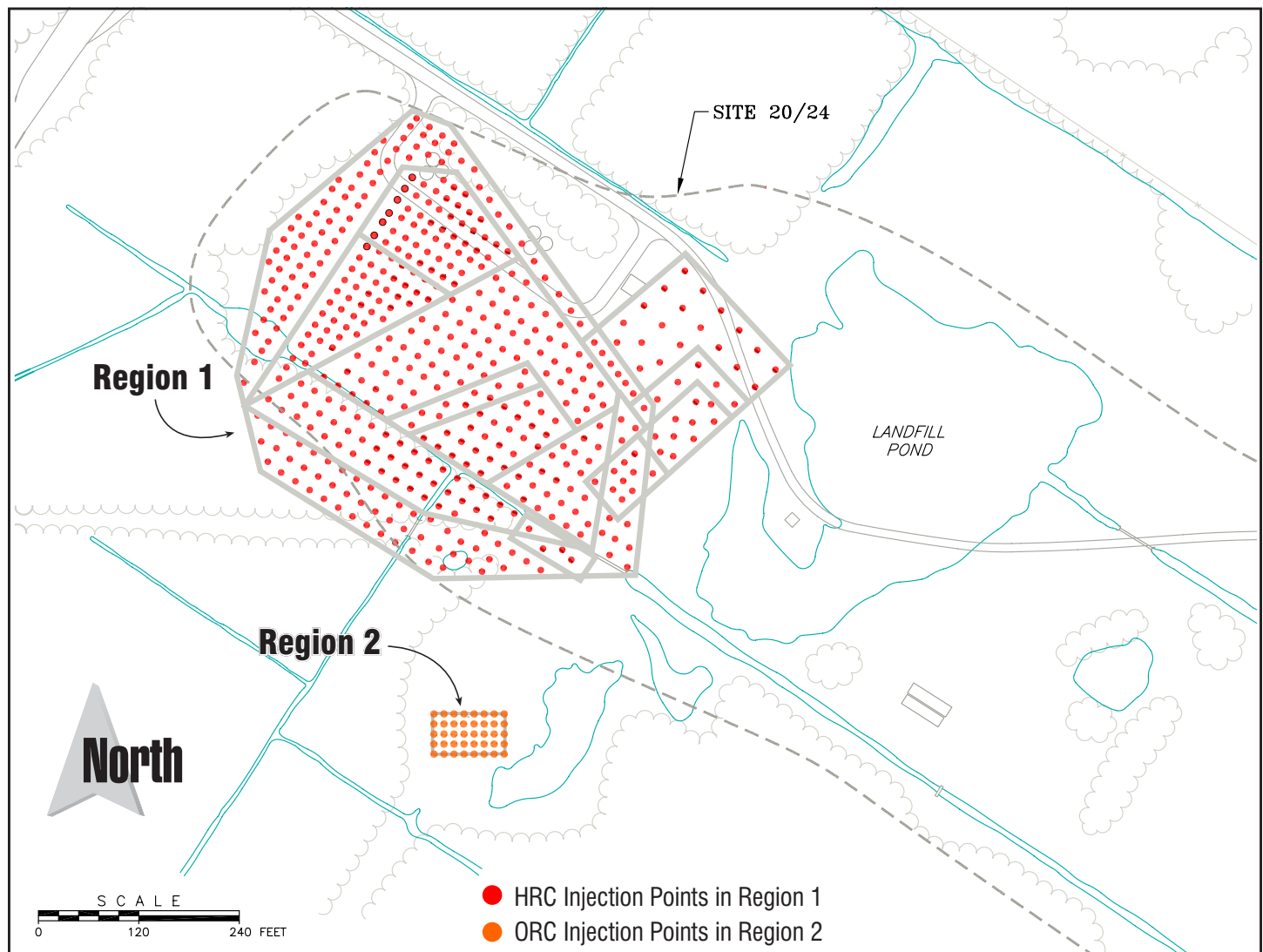


Figure 3 – Location of Proposed Treatment Areas

Groundwater in Region 1 will be injected with hydrogen release compounds (HRC) to allow naturally occurring microbes to breakdown contamination more quickly. Similar treatment will occur in Region 2 with oxygen release compounds (ORC).

action) requires continued restrictions on use of the land until cleanup goals are met. The selected combination of remedies, enhanced bioremediation with **hydrogen release compounds (HRC)** in Region 1 and enhanced bioremediation with **oxygen releasing compounds (ORC)** in Region 2, was determined to represent the best results compared to evaluation criteria. (The evaluation criteria include consideration for protecting human health and the environment; complying with federal and state requirements; long-term effectiveness; reducing toxicity, mobility or volume through treatment; implementability and cost.) **Pilot studies** conducted at Site 20/24 between October 2003 and January 2005 showed both HRC and ORC to be effective cleanup methods for the respective areas.

The selected remedies would involve injecting chemicals beneficial to **microbes** that naturally break down, or **attenuate**, the VOCs. Promoting faster growth of the microbes will result in quicker breakdown of the contaminants and thus restoration of groundwater quality. The chemicals—HRC for Region 1 contaminants and ORC

for Region 2 contaminants—will be placed in the plumes through a series of injection points, as shown in Figure 3. HRC and ORC are non-hazardous, food-grade products in the form of thick liquids. A small, truck-mounted drilling rig will be used to pump small amounts of the products into the injection points at various depths, depending on which underlying groundwater aquifer is affected.

Because of the high number of injections and extended treatment area in Region 1, cleanup under the selected option, Alternative 5b, will be accomplished more quickly than the similar Alternative 5a—that is, 7 years versus 32 years. The Army believes that the benefit of achieving cleanup more quickly offsets the slightly increased cost of Alternative 5b versus 5a.

Cleanup standards for groundwater in Region 2 are expected to be met within two years. The quality of groundwater and surface water will be monitored on a quarterly basis during ORC injection. In addition, the area will be monitored for an additional two years after the injections are completed to assess the quality of continued natural attenuation.

Alternative Remedies Evaluated for Area B Groundwater

Description	Cost
Region 1	
1. No action	\$0
2. Limited Action with Monitored Natural Attenuation	\$621,300
3. In Situ Chemical Oxidation	\$2,565,000
4. In Situ Ferro Iron Slurry Injection with Pneumatic Fracturing and Monitored Natural Attenuation	\$2,859,300
5a. Enhanced Bioremediation with Hydrogen Release Compound	\$1,298,900
5b. Expedited Bioremediation with Hydrogen Release Compound	\$1,548,200
Region 2	
6. No Action	\$0
7. Limited Action with Monitored Natural Attenuation	\$211,000
8. Enhanced Bioremediation with Oxygen Release Compound	\$212,000
Regions 1 and 2 Combined	
9. Configured Groundwater Extraction Wells for Contaminant Mass Removal	\$3,629,700

shaded rows indicate proposed remedies

Public Participation

The U.S. Department of the Army, in consultation with the USEPA and the NJDEP, invites public comment on the Proposed Plan for Area B Groundwater at Picatinny. **Written comments must be postmarked no later than November 7, 2005 and must be addressed to:**

Commander
US Army Installation Management
Agency
Northeast Regional Office Garrison
ATTN: Environmental Affairs
Directorate/Mr. Ted Gabel, Building 319
Picatinny, NJ 07806-5000
or emailed to:
ted.gabel@us.army.mil

Comments will also be accepted at the public meeting at the following date and time:

October 6, 2005 at 7:00 p.m.
Hampton Inn
350 Morris Avenue
Denville, NJ 07835
973-664-1050

Special provisions will be made for the handicapped and hearing impaired. For directions, please call (973) 664-1050. For all other questions, please contact:

Public Affairs Office
(973) 724-6365
frank.misurelli@us.army.mil
Picatinny, NJ 07806-5000

For More Information

You may review the Proposed Plan, as well as other environmental documents for Picatinny, at the following information repositories:

Environmental Affairs Directorate
 Building 319, Rockaway Township,
 NJ 07866
 Phone: 973-724-6713

Rockaway Township Library
 61 Mount Hope Road, Rockaway,
 NJ 07866
 Phone: 973-627-2344

Morris County Library
 30 East Hanover Avenue, Whippany,
 NJ 07981
 Phone: 973-285-6930