

AD-A214 552

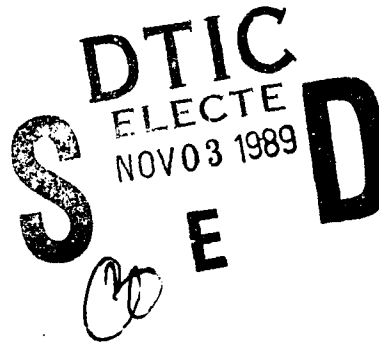
USATHAMA

U.S. Army Toxic and Hazardous Materials Agency

Enhanced Preliminary Assessment Report:

Davisville Army Housing Units
North Kingstown, Rhode Island

October 1989



prepared for

Commander
U.S. Army Toxic and Hazardous Materials Agency
Aberdeen Proving Ground, Maryland 21010-5401

prepared by

Environmental Research Division
Argonne National Laboratory
Argonne, Illinois 60439

This document has been approved
for public release and sale; its
distribution is unlimited.

89 11 01 030

Enhanced Preliminary Assessment Report:

Davisville Army Housing Units North Kingstown, Rhode Island

October 1989

Accession For	
NTIS GRA&I	<input checked="checked" type="checkbox"/>
DTIC TAB	<input checked="checked" type="checkbox"/>
Unannounced	<input type="checkbox"/>
Justification	
By	
Distribution/	
Availability Codes	
Dist	Special
A-1	

prepared for

Commander, U.S. Army Toxic and Hazardous Materials Agency,
Aberdeen Proving Ground, Maryland 21010-5401



Environmental Research Division,
Argonne National Laboratory, Argonne, Illinois 60439-4815

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE

REPORT DOCUMENTATION PAGE

1a. REPORT SECURITY CLASSIFICATION Unclassified		1b. RESTRICTIVE MARKINGS	
2a. SECURITY CLASSIFICATION AUTHORITY		3. DISTRIBUTION/AVAILABILITY OF REPORT Distribution Unlimited	
2b. DECLASSIFICATION/DOWNGRADING SCHEDULE			
4. PERFORMING ORGANIZATION REPORT NUMBER(S)		5. MONITORING ORGANIZATION REPORT NUMBER(S) CETHA-BC-CR89281	
6a. NAME OF PERFORMING ORGANIZATION Environmental Research Div. Argonne National Laboratory	6b. OFFICE SYMBOL (If applicable) ERD	7a. NAME OF MONITORING ORGANIZATION U.S. Army Toxic & Hazardous Matls. Agency	
6c. ADDRESS (City, State, and ZIP Code) Building 203 9700 South Cass Avenue Argonne, IL 60439		7b. ADDRESS (City, State, and ZIP Code) Attn: CETHA-BC Aberdeen Proving Ground, MD 21010-5401	
8a. NAME OF FUNDING/SPONSORING ORGANIZATION U.S. Army Toxic & Hazardous Materials Agency	8b. OFFICE SYMBOL (If applicable) CETHA-BC	9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER U.S. Department of Energy Contract W-31-109-ENG-38	
8c. ADDRESS (City, State, and ZIP Code) U.S. Army Toxic & Hazardous Materials Agency Attn: CETHA-BC Aberdeen Proving Ground, MD 21010-5401		10. SOURCE OF FUNDING NUMBERS	
		PROGRAM ELEMENT NO.	PROJECT NO.
		TASK NO.	WORK UNIT ACCESSION NO.
11. TITLE (Include Security Classification) Enhanced Preliminary Assessment Report: Davisville Army Housing Units North Kingstown, RI			
12. PERSONAL AUTHOR(S)			
13a. TYPE OF REPORT Final	13b. TIME COVERED FROM TO	14. DATE OF REPORT (Year, Month, Day) October, 1989	15. PAGE COUNT
16. SUPPLEMENTARY NOTATION			
COSATI CODES		18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)	
FIELD	GROUP SUB-GROUP		
19. ABSTRACT (Continue on reverse if necessary and identify by block number)			
<p>Argonne National Laboratory has conducted an enhanced preliminary assessment of the Army housing property located in North Kingstown, RI. The objectives of this assessment include identifying and characterizing all environmentally significant operations, identifying areas of environmental contamination that may require immediate remedial actions, identifying other actions which may be necessary to resolve all identified environmental problems, and identifying other environmental concerns that may present impediments to the expeditious sale of this property. <i>Keywords: Contamination, Hazardous materials, Housing (Residences), Toxicity, Environmental Contamination, etc.</i></p>			
20. DISTRIBUTION/AVAILABILITY OF ABSTRACT <input checked="" type="checkbox"/> UNCLASSIFIED/UNLIMITED <input type="checkbox"/> SAME AS RPT. <input type="checkbox"/> DTIC USERS		21. ABSTRACT SECURITY CLASSIFICATION Unclassified	
22a. NAME OF RESPONSIBLE INDIVIDUAL Joseph A. Ricci, Project Officer		22b. TELEPHONE (Include Area Code) (301) 671-3461	22c. OFFICE SYMBOL CETHA-BC

CONTENTS

SUMMARY	1
1 INTRODUCTION	3
1.1 Authority for the PA	3
1.2 Objectives	4
1.3 Procedures	4
2 PROPERTY CHARACTERIZATION	6
2.1 General Property Information	6
2.2 Description of Facility	6
2.3 Property History	8
2.4 Environmental Setting and Surrounding Land Use	8
2.5 Geologic and Hydrologic Settings	9
3 ENVIRONMENTALLY SIGNIFICANT OPERATIONS	12
4 KNOWN AND SUSPECTED RELEASES	13
5 PRELIMINARY ASSESSMENT CONCLUSIONS	14
6 RECOMMENDATIONS	15
REFERENCES	16
APPENDIX: Photographs of Davisville Housing Facility and Surrounding Land	17

FIGURES

1 Vicinity Map of Davisville Army Housing Area	7
2 Site Plan Map of Davisville Army Housing Units	8

SUMMARY

The Davisville housing area, a 14-acre site located at the former Quonset Point Naval Station in North Kingstown, R.I., does not constitute an imminent or substantial threat to human health or the environment. The Davisville housing was constructed by the Navy in 1965. In 1976 it was transferred to the Army.

Based on a review of both historical and current practices at the property, and on personal observations by Argonne National Laboratory (ANL) investigators, it has been concluded that the Davisville housing area is well maintained and that no actions are necessary prior to the release of this property.

1 INTRODUCTION

In October 1988, Congress passed the Defense Authorization Amendments and Base Closure and Realignment Act, Public Law 100-526. This legislation provided the framework for making decisions about military base closures and realignments. The overall objective of the legislation is to close and realign bases so as to maximize savings without impairing the Army's overall military mission. In December 1988, the Defense Secretary's ad hoc Commission on Base Realignment and Closure issued its final report nominating candidate installations. The Commission's recommendations, subsequently approved by Congress, affect 111 Army installations, of which 81 are to be closed. Among the affected installations are 53 military housing areas, including the Davisville housing area addressed in this preliminary assessment.¹

Legislative directives require that all base closures and realignments be performed in accordance with applicable provisions of the National Environmental Policy Act (NEPA). As a result, NEPA documentation is being prepared for all properties scheduled to be closed or realigned. The newly formed Base Closure Division of the U.S. Army Toxic and Hazardous Materials Agency is responsible for supervising the preliminary assessment effort for all affected properties. These USATHAMA assessments will subsequently be incorporated into the NEPA documentation being prepared for the properties.

This document is a report of the enhanced preliminary assessment (PA) conducted by Argonne National Laboratory (ANL) at the Army stand-alone housing area in North Kingstown, R.I.

1.1 AUTHORITY FOR THE PA

The USATHAMA has engaged ANL to support the Base Closure Program by assessing the environmental quality of the installations proposed for closure or realignment. Preliminary assessments are being conducted under the authority of the Defense Department's Installation Restoration Program (IRP); the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Public Law 91-510, also known as Superfund; the Superfund Amendments and Reauthorization Act of 1986, Public Law 99-499; and the Defense Authorization Amendments and Base Closure and Realignment Act of 1988, Public Law 100-526.

In conducting preliminary assessments, ANL has followed the methodologies and procedures outlined in Phase I of the IRP. Consequently, this PA addresses all documented or suspected incidents of actual or potential release of hazardous or toxic constituents to the environment.

In addition, this PA is "enhanced" to cover topics not normally addressed in a Phase I preliminary assessment. Specifically, this assessment considers and evaluates the following topical areas and issues:

- Status with respect to regulatory compliance,
- Asbestos,
- Polychlorinated biphenyls (PCBs),
- Radon hazards (to be assessed and reported on independently),
- Underground storage tanks,
- Current or potential restraints on facility utilization,
- Environmental issues requiring resolution,
- Health-risk perspectives associated with continued residential land use, and
- Other environmental concerns that might present impediments to the expeditious "excessing," or transfer and/or release, of federally owned property.

1.2 OBJECTIVES

This enhanced PA is based on existing information from Army housing records of initial property acquisition, initial construction, and major renovations and remodeling performed by local contractors or by the Army Corps of Engineers. The PA effort does not include the generation of new data. The objectives of the PA include:

- Identifying and characterizing all environmentally significant operations (ESOs),
- Identifying property areas or ESOs that may require a site investigation,
- Identifying ESOs or areas of environmental contamination that may require immediate remedial action,
- Identifying other actions that may be necessary to address and resolve all identified environmental problems, and
- Identifying other environmental concerns that may present impediments to the expeditious transfer of this property.

1.3 PROCEDURES

The PA began with a review of Army housing records located at Fort Devens, Mass., approximately 35 miles northwest of Boston the week of May 15-19, 1989. Additional information was obtained from the Army Corps of Engineers District Office in Waltham, Mass., on May 17, and from conversations with personnel from the office of the Area Engineer, Fort Devens on May 18. A site visit was conducted at the Davisville housing area, North Kingstown, R.I., on May 18, 1989, at which time additional information was obtained through personal observations of ANL investigators. Photographs were taken of the housing units and surrounding properties as a means of documenting the condition of the housing units and immediate land uses. Site photographs are appended.

All available information was evaluated with respect to actual or potential releases to air, soil, and surface and ground waters.

Attempts to gain access to the housing units through involvement of the senior occupant were unsuccessful. Therefore, internal inspection of the units was not possible during the site visit. However, ANL investigators revisited the property on September 9, 1989 at which time the interiors of all the houses were inspected.

2 PROPERTY CHARACTERIZATION

2.1 GENERAL PROPERTY INFORMATION²⁻⁴

The Davisville Army housing area is located in the southwest portion of the former Quonset Point Naval Air Station, in the city of North Kingstown, Washington County, Rhode Island. The area contains 21 structures and 62 family housing units. The units front on a U.S. government-owned street, Navy Drive. The Davisville housing area consists of 14 acres of real estate. The property used to be part of the Naval Construction Battalion Center, Davisville, R.I.; it was transferred from the Department of the Navy to the Department of the Army in 1977. This property transfer enabled the consolidation of military personnel then occupying relatively poor housing into one housing area.

Figure 1 shows the general location of the Davisville housing area.

2.2 DESCRIPTION OF FACILITY

Figure 2 presents the site plan for the housing area.

Housing Units²⁻⁵

The Davisville housing area is composed of 14 acres of land and 21 structures, with 62 units of family housing and improvements. The area is located at the former Quonset Point Naval Air Station. The buildings were constructed in 1965 on concrete slabs, with exterior walls of wood siding on wood and bituminous shingle roofs. They are all two-story dwellings, in three different styles, and have either three or four bedrooms in each unit. Of the 21 structures, 11 are two-unit, and 10 are four-unit officer quarters. Each apartment is equipped with a smoke/heat detector, an electric hot water system with baseboard radiation, and a hot water supply tank with a capacity of 82 gallons.

Utilities²

Navy Drive is improved with an overhead line bringing municipally supplied electricity as well as telephone service to the area. Transformers located on the property are not Army-owned. Solid waste (garbage) is deposited by occupants in a solid-waste dumpster staged at the east property boundary of the housing area, where it is compacted and periodically trucked away for disposal by the municipality.

Water and Sewage Treatment

The water supply and sanitary and sewage services were once supplied by the Quonset Point Naval Air Station. They are now provided by the Rhode Island Port

Authority. No documentation could be found that identifies the date of the change in services or the details of the decommissioning and abandonment of the original utility lines. These lines are presumed to have been abandoned in place.

The property is drained by an underground conduit to the municipal storm sewer system.

There have been no structural improvements or major renovations at the 21 housing buildings since their initial construction in 1965.

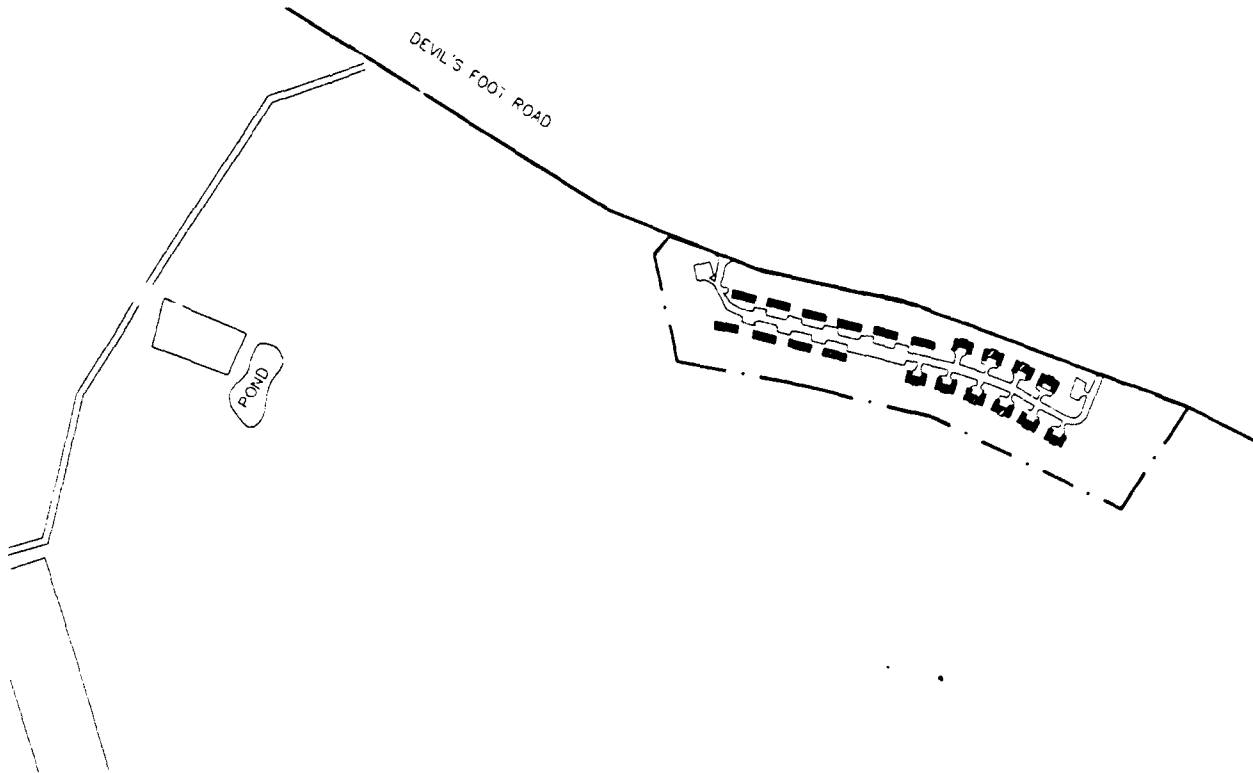


FIGURE 2 Site Plan Map of Davisville Army Housing Units

2.3 PROPERTY HISTORY⁵

The land on which the Davisville housing area is located was private property before it was acquired in 1944 in connection with the Advance Base Depot, Davisville, R.I. Housing facilities for officers were constructed in 1965 by the Navy. The area was transferred from the Department of the Navy to the Department of the Army in 1977 to accommodate personnel from the U.S. Army Recruiting Main Station and Navy and Air Force Recruiting and Reserve Component personnel in the Providence, Rhode Island, area.

2.4 ENVIRONMENTAL SETTING AND SURROUNDING LAND USE

The housing area is surrounded by woods and fences on three sides, with Devils Foot Road (Rt. 403) serving as the northern property boundary. A residential area lies to the north across Rt. 403, and commercial and light industrial areas are in close proximity to the south and east of the property. The center of the city of Providence lies approximately 20 miles to the north, and Narragansett Bay is a short distance to the east.

The area is located within the Bay Area Coastal context. Land surrounding the facility is low-lying and poorly drained, a swampy area with sandy soils. A portion of this property was wetland, which has been filled.⁶

A wooded area with a small creek flowing in an easterly direction borders the housing area to the south. Just behind the woods and adjacent to the western end of the housing area are a large water pump station and well field (believed to be owned by the Rhode Island Port Authority). A 1,000-gallon above-ground diesel-fuel storage tank adjacent to the pump station was observed to be leaking (apparently from overfilling). The Quonset Point Industrial Park is situated to the southwest of the housing area. Among the industries operating in this industrial park is a wholesale lumber company that deals in pressure-treated lumber, the majority of which is in open storage. In a small clearing behind the woods to the east of housing area (at one point, 40 feet away)⁷ is a solid-waste transfer station operated by the municipality.

Five prehistoric sites are located within 2 kilometers (km) of the facility. Three of these sites are possible Late Archaic (2500 to 1000 BC) campsites, while the other two possibly contain evidence of Woodland culture. Also located within 2 km of the housing area are three known historical sites. The Cocumscussoc trading post was the first trading post in Rhode Island, while the other sites are the Pleasant Valley School house (1848), and the Costen-Carpenter House site (17th-20th century). Nearby also is a native American burial ground, RI-694 (*10), listed on the National Register of Historic Places. In addition, a major Narragansett Indian Village site is reported to have been in the near vicinity of the housing area.⁸

2.5 GEOLOGIC AND HYDROLOGIC SETTINGS

The Davisville housing area is located in the Pawtuxet River Basin of the New England Upland section of the New England Physiographic Province. The Pawtuxet River drains 230 square miles in central Rhode Island. The upper, western part of the basin is hilly, largely forested, and relatively undeveloped. The lower, eastern part of the basin has gently rolling topography and is highly urbanized. The river discharges into the headwaters of Narragansett Bay, just south of Providence. The basin contains 80 ponds and reservoirs, including the Scituate and the Flat River reservoirs, two of the largest bodies of fresh water in the state. These reservoirs are the sources of two principal tributaries -- the north and the south branches of the Pawtuxet River -- that join to form the main stem of the Pawtuxet River 11 miles upstream from its mouth.⁹

The surface-water resources of the Pawtuxet River basin are highly developed. There are 143 dams on its 181 miles of streams. The Flat River reservoir, completed about 1875, with a usable capacity of 5,700 acre-feet ($1,870 \times 10^6$ gal), was constructed to provide hydropower and process water for textile mills. The Scituate reservoir, completed in 1926, was constructed to provide water for the public supplies of Providence and adjacent communities. This reservoir and five smaller feeder reservoirs with a combined usable capacity of 121,900 acre-feet ($39,700 \times 10^6$ gal) supplied 37% of all offstream fresh water withdrawals in Rhode Island in 1980.⁹

The flow of the Pawtuxet River is affected by regulated releases from the Scituate reservoir and, to a lesser extent, from the Flat River reservoir. Out-of-basin transfers from the Scituate reservoir reduce the average annual discharge of the Pawtuxet River. However, releases from both the Flat River and Scituate reservoirs during dry weather cause a higher flow per unit of drainage area in the Pawtuxet than in any other major stream in Rhode Island. The 7-day, 10-year low flow off the Pawtuxet River at Cranston is 73 cubic feet per second (46×10^6 gal/day).

Headwaters of the basin are relatively free of pollution. Downstream from the Scituate and the Flat River reservoirs, however, streamflow is degraded by industrial and municipal wastewater and by seepage from a landfill. Concentrations of dissolved solids in the lower reaches of the main stem often exceed 200 milligrams per liter (mg/L) and, at times, exceed 500 mg/L. In 1984, all of the main stem and the lower reaches of its two principal tributaries were unsuitable for water-contact activities.

The average annual precipitation in the area is about 42 inches. The mean annual lake evaporation is 27 inches. The average annual runoff is 22 inches. The 1-year, 24-hour rainfall is about 3 inches.

Groundwater is present in two types of aquifers -- unconsolidated Pleistocene glacial deposits and consolidated Paleozoic bedrock. The glacial deposits, which overlie and largely conceal bedrock, are divided into stratified drift and till. Stratified drift consists of interbedded lenses of stratified and sorted gravel, sand, and silt. Till consists of a poorly sorted mixture of boulders, gravel, sand, silt, and some clay. Stratified drift constitutes the principal aquifer. Till and bedrock constitute minor, but important, aquifers that provide small supplies to homes.¹⁰

Stratified drift mantles the bedrock surface in about one-third of the state, chiefly in valleys. These deposits are commonly 75 to 125 feet thick. The thickest and most transmissive parts of the stratified-drift aquifers can yield as much as 700 gallons per minute (gal/min) to wells. Dissolved-solids concentrations in groundwater generally were less than 100 mg/L, which is significantly smaller than the drinking-water standard of 500 mg/L. In the Providence area, where stratified drift overlies and is partly derived from sedimentary rocks, a few analyses of water from wells indicated that dissolved-solids concentrations in groundwater may be larger there than in most other areas of Rhode Island.

Glacial till covers bedrock in about two-thirds of the state, chiefly in the upland areas. Average thickness of the till is about 20 feet. Till aquifers once were tapped by many large-diameter dug wells that provided small, commonly unreliable, yields to much of the state's population. Many older homes still obtain water from wells in the till aquifers. However, because wells in till may become dry during droughts, and because these wells are more susceptible to contamination from individual sewage-disposal systems, most such wells have been abandoned in favor of deeper wells drilled into bedrock.¹¹

Bedrock aquifers store and transmit water through a network of narrow, widely spaced fractures. Significantly indurated to largely metamorphosed sedimentary rocks (conglomerate, sandstone, shale, and some coal) of Pennsylvania age underlie

Narragansett Bay and adjacent land areas. Crystalline igneous and metamorphic rocks that are mostly of granitic composition underlie the southeasternmost part of the state and most of the area west of Narragansett Bay. These bedrock units generally yield less than 20 gal/min to wells usually 100 to 300 feet deep. Most of the 9% of the state's population not served by public-supply systems obtain their water from wells that penetrate bedrock aquifers.

In 1985, 24% of Rhode Island's nearly 1 million people obtained their drinking supplies from groundwater. Most of this water was pumped from public-supply wells completed in principal stratified-drift aquifers. The quality of groundwater in most parts of the state is suitable for human consumption and other uses with little or no treatment. Typically, groundwater has dissolved-solids concentrations smaller than 200 mg/L and is soft (hardness less than 60 mg/L as calcium carbonate), slightly acidic (pH 5.5 to 7.0), and cold (10 to 12° Celsius). However, Rhode Island's groundwater is very vulnerable to contamination because it occurs nearly everywhere under unconfined conditions and because the water table commonly is less than 20 feet beneath the land surface. Locally, the quality of groundwater has been moderately to severely degraded.

The principal sources of groundwater contaminants are waste-disposal sites, underground fuel-storage tanks, surface impoundments of liquid wastes, solid-waste landfills, septic systems and cesspools, storage areas for highway deicing salt, and oil and chemical spills.

3 ENVIRONMENTALLY SIGNIFICANT OPERATIONS

The ANL investigation team found the Davisville housing area to be in good condition and not the source of adverse environmental impacts. There have never been fuel-storage tanks located on the property. The property is in a commercially developed area, with all utilities supplied by the municipality. The municipal power company owns the electrical transformers on-site.

Construction records do not indicate the use of any asbestos-containing materials. No asbestos-containing materials could be identified in any of the housing units during inspection on September 9, 1989. Water pipes contained no insulation whatsoever.

4 KNOWN AND SUSPECTED RELEASES

Because of the strictly residential nature of the facility, no major releases of contaminants to the environment are believed to have occurred at the Davisville housing area. No hazardous wastes or hazardous material other than household items are present on-site.

Some facilities on land near the housing area have the potential to affect the environment. The facilities include solid-waste dumpsters, a water pump station and well field (associated with the above-ground storage of diesel fuel), and a lumber company storing large quantities of treated lumber. There is no documentation of actual contaminant releases from any of these surrounding activities and therefore no evidence that they have adversely affected the housing area.

5 PRELIMINARY ASSESSMENT CONCLUSIONS

The Davisville housing area does not constitute an imminent or substantial threat to the environment or human health and has not adversely affected the environment. However, several operations in the immediate vicinity of the property may affect the environment. These include a nearby pump station with an above-ground diesel fuel tank, a nearby lumber company that stores large quantities of treated lumber, and the nearby solid-waste transfer station discussed in Sec. 2. Because these operations are outside the property limit of the Davisville housing area, and therefore not under investigation, this report does not attempt to elaborate on their possible environmental impacts.

Prehistoric and historic sites are located within 2 km of the facility (Sec. 2.2.2). Also nearby is a native American burial ground, RI-694 (*10), listed on the National Register of Historic Places. In addition, a major Narragansett Indian Village site is reported to have been in the near vicinity.

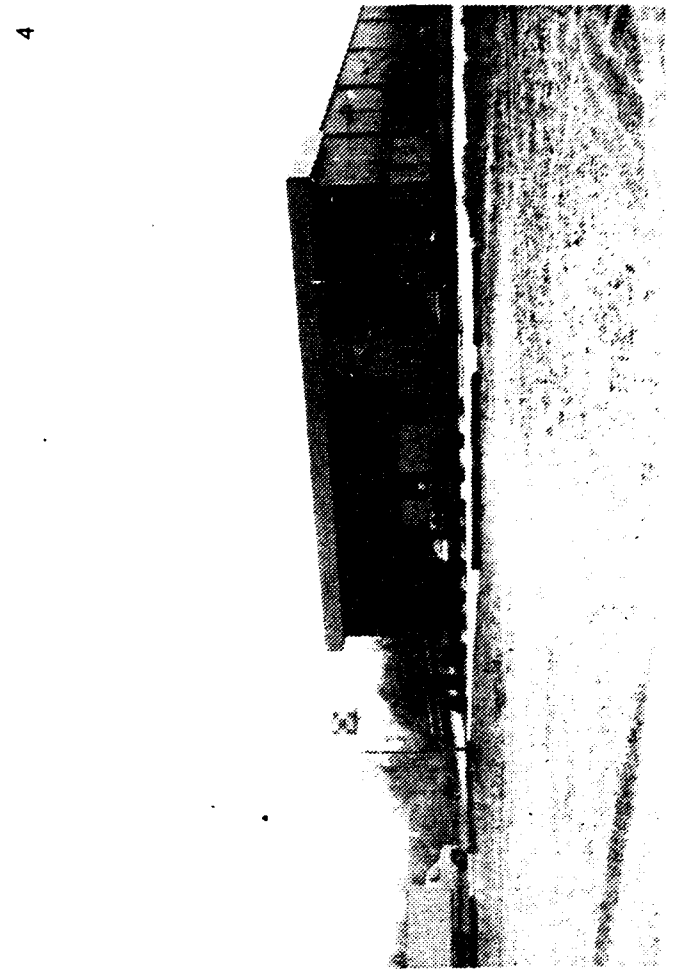
6 RECOMMENDATIONS

Based on available documentation, interviews with personnel who might have knowledge of the existing property, and personal observations, the Davisville housing area is well maintained. No actions are necessary prior to the release of this property.

REFERENCES

1. *Base Realignments and Closures*, Report of the Secretary's Commission (Dec. 1988).
2. Real Estate Planning Report, Proposed Transfer from Navy to Army of 62 Family Housing Units, Quonset Point Naval Air Station, Rhode Island (1975).
3. Survey of Davisville, Rhode Island Family Housing Area, R.F. Winter, Directorate of Engineering and Housing (March 17, 1988).
4. Letter from Commanding Officer, Naval Facilities Engineering Command to District Engineer, Army Corps of Engineers, New York, Subject: Transfer of 14 acres of land and improvements thereon from the Department of the Navy to the Department of the Army (April 14, 1977).
5. Letter from F.S. Thomson, Commanding Officer of Naval Construction Battalion Center, to District Engineer, New York District, Subject: Forwarding of License NF(R)-26505 for Use of 62 Units of Family Housing by the Department of the Army (Oct. 9, 1975).
6. Personal notes taken by Mary Hansen and Steven Miller during their on-site visit to Davisville Housing Area (May 18, 1989).
7. Letter from Office of the Attorney General, Washington, D.C. to Secretary of the Navy (July 1977).
8. Letter to Col. Anthony Carbone, Department of the Army, Fort Devens, Mass., from Edward Sanderson, Deputy State Historical Preservation officer, re: An Archeological Survey at Fort Devens, Massachusetts and Its Off-Base Facilities (Nov. 7, 1984).
9. U.S. Geological Survey, *National Water Summary, 1985 Hydrologic Events and Surface-Water Resources*, Water Supply Paper 2300 (1986).
10. U.S. Geological Survey, *National Water Summary, 1986 Hydrologic Events and Ground-Water Resources*, Water Supply Paper 2325 (1987).
11. Sagwinsin, J.L.S., et al., *The Northeast Regional Environmental Impact Study: Description of the Existing Northeast Regional Geohydrology*, U.S. Department of Energy Report DOE/RG-0059 (1981).

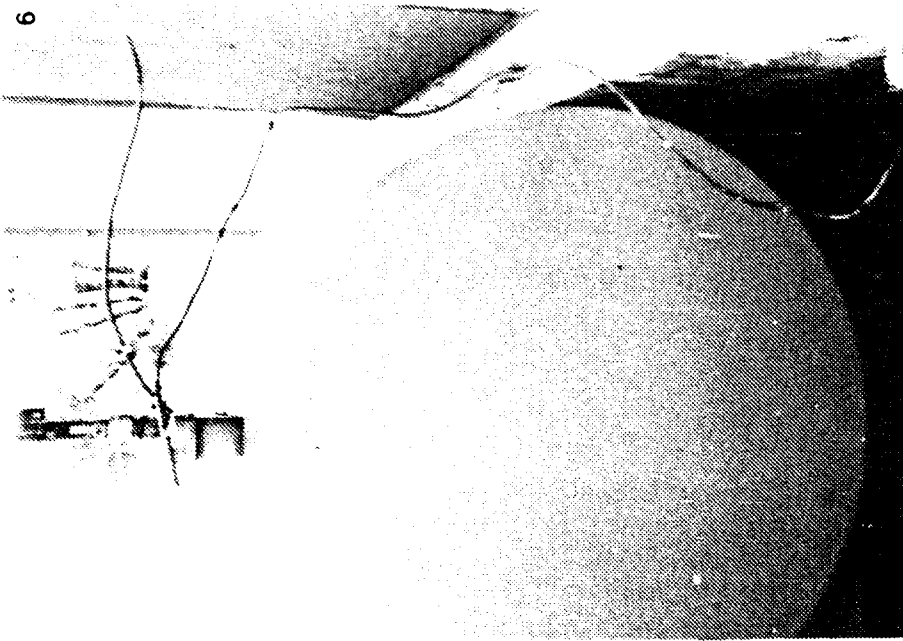
APPENDIX:
PHOTOGRAPHS OF DAVISVILLE HOUSING FACILITY
AND SURROUNDING LAND



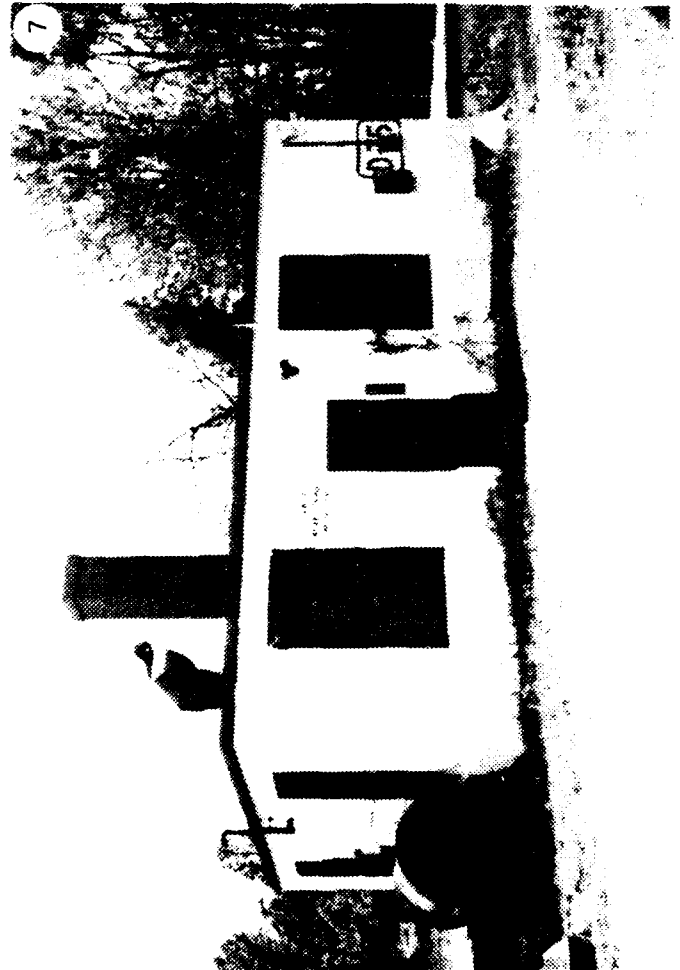
5



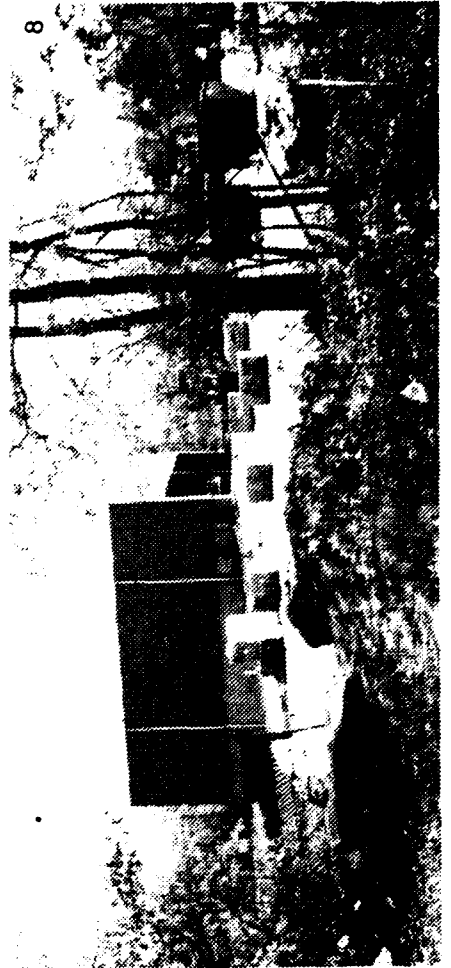
6



7



8



IDENTIFICATIONS OF PHOTOGRAPHS

1. Three-bedroom duplex, with cathedral ceiling in the living room.
2. Wooded area, south of the housing facility.
3. Play area for children.
4. A lumber company building, situated southeast of the housing area.
5. Quonset Point Industrial Park, situated southwest of the housing area.
6. An above-ground storage tank showing fill pipe and delivery lines.
7. The water pump station building, behind a wooded section near the western end of the housing area.
8. The solid-waste transfer station, located in a clearing at the east end of the housing area.

