

# USATHAMA

U.S. Army Toxic and Hazardous Materials Agency

## Enhanced Preliminary Assessment Report:

Livingston Army Housing Units  
East Hanover Township, New Jersey

November 1989

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prepared for

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## SUMMARY

The Livingston (or Morristown) housing area in Morris County, N.J., does not present an imminent or substantial threat to human health or the environment. There is no evidence to suggest that hazardous or toxic constituents have ever been released from this property, and no immediate remedial actions are warranted for the site. Nevertheless, several potential environmental problems have been identified at this facility, and further investigation is recommended.

This property was originally developed in conjunction with a Nike missile battery located near Hanover Neck, an unincorporated area, and the town of Florham Park, N.J. No record exists of any wastes associated with the operation and maintenance of the missile-launch or fire-control systems having ever been delivered to or managed at this housing property. Potable water and sewage-treatment service are currently provided by facilities located on the housing site. These facilities also probably provided utility service to the adjacent former launch area when it was active. It is possible that contaminants from the former launch area have migrated to the housing areas along buried water and sewage lines.

Underground heating oil tanks, located at each housing unit on the property, represent another environmental concern. Although there is no documentation of reported failures or suspected leaks for any of these tanks, real property records indicate that the tanks are more than 30 years old. There are no records indicating that they were installed with the benefit of cathodic protection, protective coatings, or other corrosion-prevention measures. Each of these tanks may therefore be at or near the end of its effective life.

Electrical service at the Livingston housing facility is provided by a local public utility, but the transformers located on utility poles within the facility are owned and maintained by the U.S. government. These transformers are not routinely inspected for possible leakage, and they have never been tested for possible inclusion of polychlorinated biphenyls (PCBs). Contamination of soil and groundwater with PCBs from potential leaks or spills associated with these transformers is a concern, although no such spills or leaks were apparent during the site inspection.

The original floor tiles used in these housing units are believed to have contained asbestos. In recent years, the old flooring has been systematically replaced whenever a change of tenant has occurred, but the possibility exists that original flooring is still present in a few of these units.

Prior to release of this property, the following actions are recommended:

- Remove and replace underground heating oil tanks at all units on the property, sample soils in all portions of the tank excavations to identify any possible areas of contamination, and remediate any problems encountered.

- Test the contents of on-site transformers as well as the soil at the base of transformer poles for the presence of PCBs, label all transformers as to their contents, and remediate soil contamination as required.
- Test the soil in the vicinity of the underground water and sewer lines for the presence of missile-related contaminants that may have originated in the former launch area.

These recommendations assume that this property will most likely continue to be used for residential housing.

## 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 Livingston housing area addressed in this preliminary assessment.<sup>1</sup>

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 near Livingston, N.J.

### 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 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 Dix, N.J., during the week of August 7-11, 1989. Additional information was obtained by telephone from the Army Corps of Engineers District Office in New York City on August 11, 1989, and from conversations with personnel from the Directorate of Engineering and Housing (DEH) and the Department of Family Housing, Fort Dix, during the period August 7-10. A site visit was conducted at the Livingston housing facility on August 9, 1989, at which time additional information was obtained through personal observations of the ANL investigator. The interior of unit #232 was examined. 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. ANL investigators revisited the property on September 12, 1989, at which time the interiors of all of the units were inspected.

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

## 2 PROPERTY CHARACTERIZATION

### 2.1 GENERAL PROPERTY INFORMATION

The Livingston housing area is located in northern New Jersey, in eastern Morris County, near the unincorporated area of Hanover Neck in East Hanover Township, north of the town of Florham Park. The property comprises 13.96 acres,<sup>2</sup> surrounded primarily by commercial development. The 1980 populations of East Hanover Township and Florham Park were 9,319 and 9,359, respectively.<sup>3</sup> Land adjacent to the housing area originally comprised the missile-launch area for the Nike battery. This land was declared excess in 1975.<sup>2</sup> No records or documentation of any environmental problems, or any sampling or testing associated with the former launch area were found. Current use of this land is described in Sec. 2.4.

Figures 1 and 2 show the general location of the housing facility.<sup>2</sup>

The housing units were built in 1956.<sup>2</sup> In addition to 32 dwellings, a pumphouse, well, water tank, and sewage-treatment plant were erected on the property. The Army Corps of Engineers district office located in New York City is responsible for major renovations or upgrading within the Livingston housing area.

### 2.2 DESCRIPTION OF FACILITY

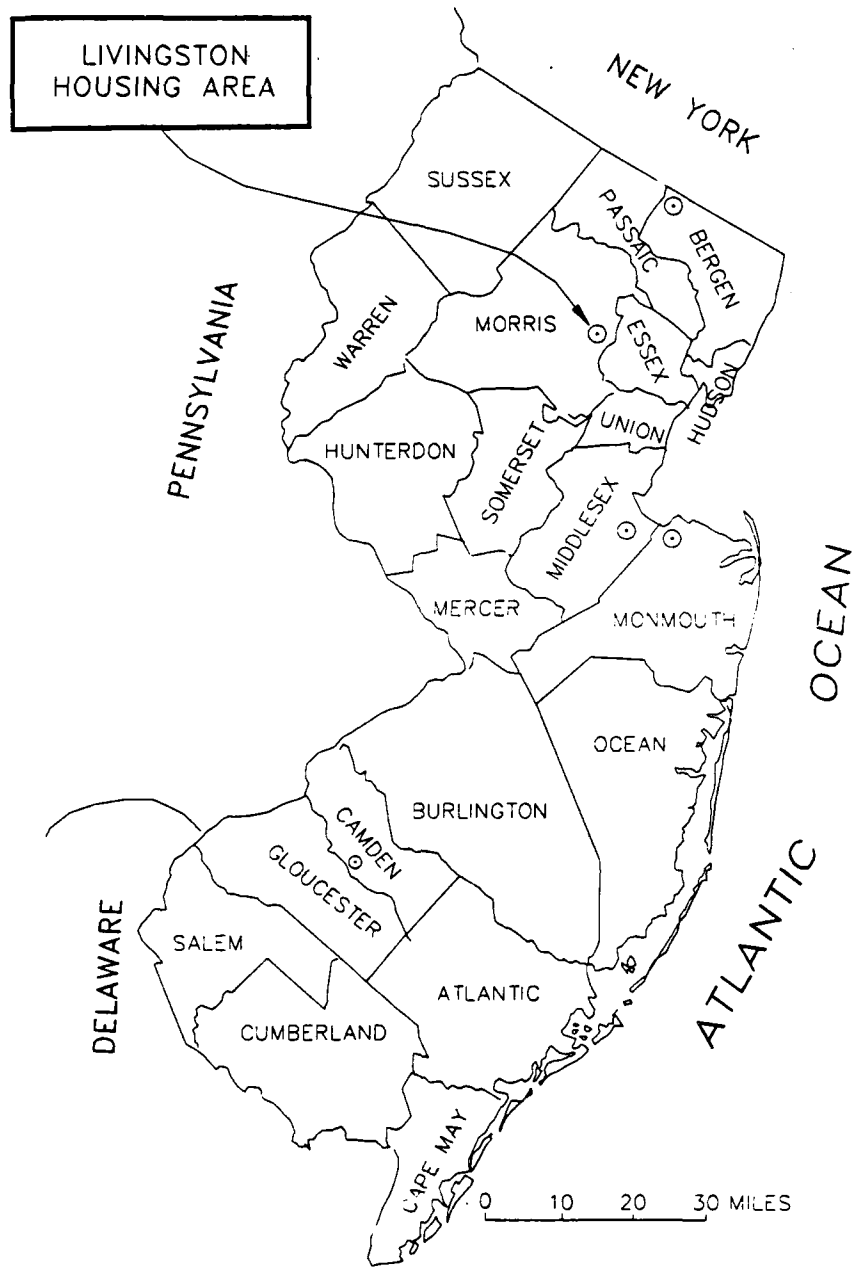
Figure 3 presents the site plan of the Livingston housing area.

#### Housing Units

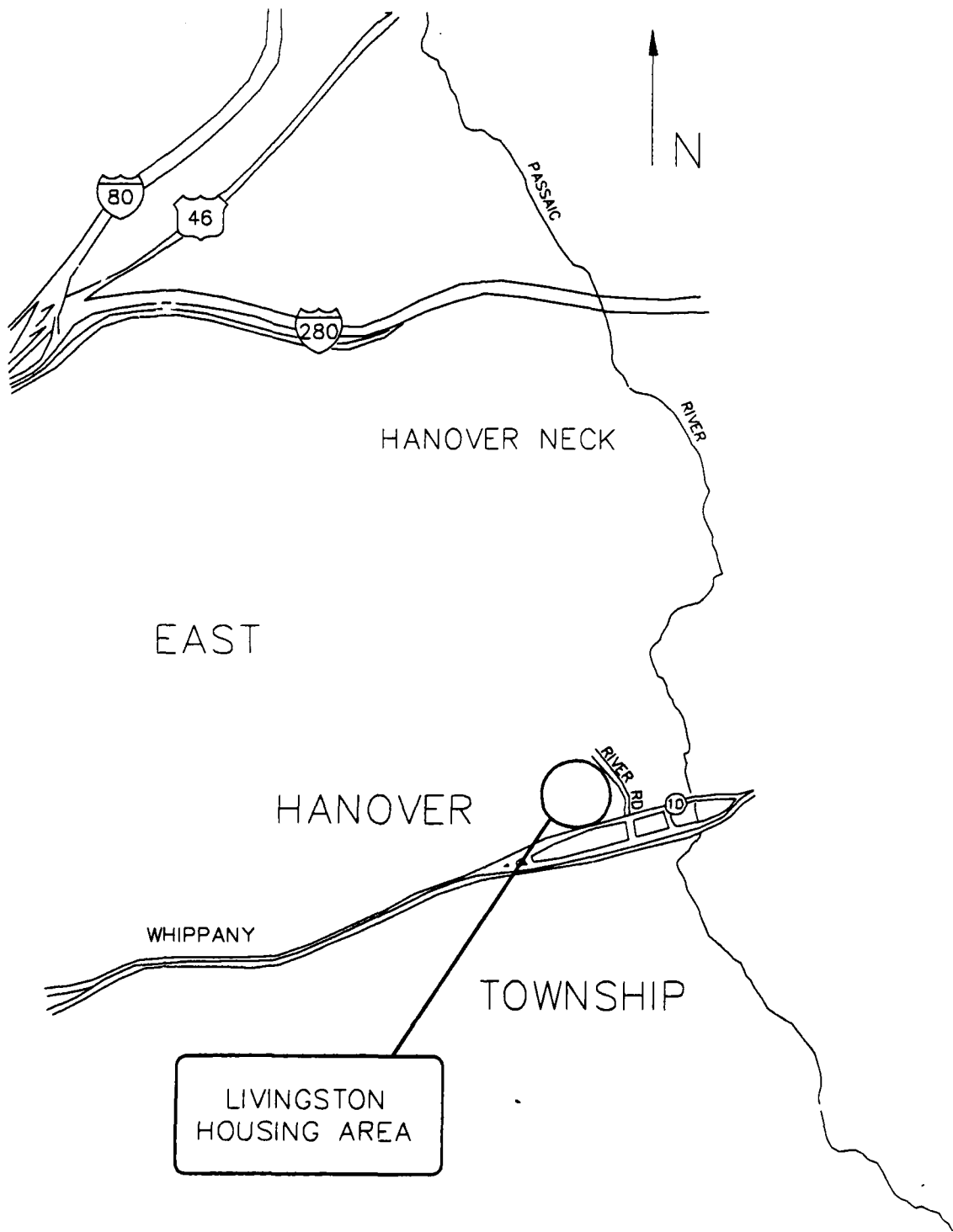
The Livingston housing area consists of 32 "Capehart"-style houses, each having three bedrooms, one family room, a carport, and storage room.<sup>4</sup> Capehart is the model name assigned to these houses by the builder, National Homes. The houses are built on concrete slabs. Water lines and air conditioning ducts are embedded in the foundation slab.

#### Utilities

Since development of the property, the housing units have been supplied with drinking water from the well located on the housing area property.<sup>2</sup> In all probability, the same facility supplied water to the launch area when it was active. The DEH at Fort Dix has had the responsibility for providing potable water to the housing units since construction in 1956.<sup>2</sup> Because of increasing costs of operating this remote well, the DEH is currently evaluating the possibility of connecting to the East Hanover Township municipal water system.<sup>5,6</sup> The property receives electricity from a local public utility, but on-site telephone poles and electrical transformers are the responsibility of the Army.<sup>5,6</sup>



**FIGURE 1 Location Map of New Jersey Army Housing Facilities**



**FIGURE 2 Vicinity Map of Livingston Army Housing Units**

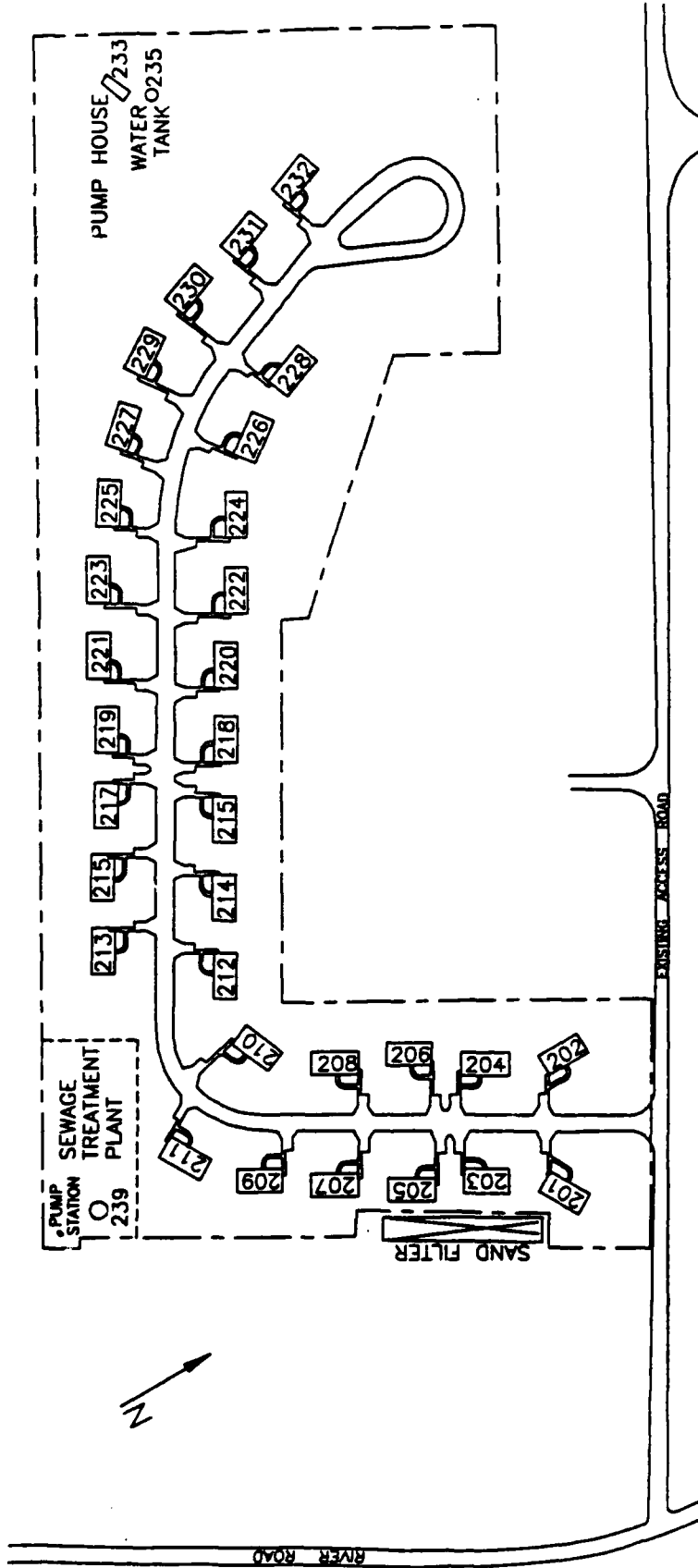


FIGURE 3 Site Plan Map of Livingston Army Housing Units

## **Sewage**

Wastewater treatment has been provided to the Livingston housing area since its construction in 1956 by a plant located on-site. In all probability, the same facility provided sanitary sewer treatment service to the launch area when it was active, although no documentation could be found to confirm this past sewage connection. Responsibility for providing this service has rested with the DEH at Fort Dix since initial construction.<sup>2</sup> Since 1956, all sewage sludge recovered from the treatment facility has been transported to Fort Dix for disposal.<sup>5</sup> DEH currently holds a New Jersey Pollutant Discharge Elimination System permit for the discharge from the treatment plant. Because of increasing stringency of the permitted discharge limits, however, a contract for the connection of the wastewater lines in the Livingston housing area with the East Hanover Township municipal sewer system should soon be completed and the on-site treatment plant shut down.<sup>5-8</sup> The current facility is located in the southeast corner of the housing area, essentially the lowest topographic point on the property.

## **Fuel Storage**

Each unit has an underground storage tank that holds 275 gallons of fuel oil for heating.<sup>4</sup> These tanks are located behind each housing unit. All tanks are original equipment, installed during construction in 1956.<sup>4</sup> In addition, behind each unit is a 50-gallon capacity liquid propane tank to supply fuel for a gas-fired stove, oven, and water heater. These tanks are also original equipment.<sup>4</sup>

## **Storm Drainage Systems**

The property is drained by a drainage ditch that runs along the access road leading to the property as well as by surficial runoff down the natural contours of the property. Surficial runoff is in a generally south-southeast direction.

## **Other Permanent Structures or Property Improvements**

In addition to 32 housing units, a pumphouse, water tank, and wastewater treatment plant together with associated underground lines were constructed on the property in 1956.<sup>4</sup> Other property improvements added at that time include external lighting, paved roads and driveways, an overhead electrical distribution system, and a chain-link fence around the property.<sup>2</sup>

## **2.3 PROPERTY HISTORY**

### **2.3.1 Nike Defense Program and Typical Battery-Level Practices**

Generic information on the national Nike antiaircraft defense program has been compiled in two studies, one commissioned by the Army Corps of Engineers<sup>9</sup> and the

other by the U.S. Army Toxic and Hazardous Materials Agency.<sup>10</sup> In both studies, independent contractors relied on information contained in unclassified documents related to the Nike surface-to-air missile program, including engineering drawings and specifications (for the facilities and the missiles themselves), interviews with Army personnel participating in the Nike program, and operations manuals and directives relating to the operations and maintenance of Nike facilities. Taken together, these two reports represent the most complete assemblage of generic information on the Nike missile program from an environmental perspective. Salient points from both reports are condensed below.

At its zenith in the early 1960s, the Nike program included 291 batteries located throughout the continental United States. The program was completely phased out by 1976, with many of the properties sold to private concerns or excessed to state or local governments for nominal fees.

Nike Ajax missiles were first deployed in 1954 at installations throughout the continental United States, replacing, or in some cases augmenting, conventional artillery batteries and providing protection from aerial attack for strategic resources and population centers. Typically, Nike batteries were located in rural areas encircling the protected area. The Ajax was a two-stage missile using a solid-fuel booster rocket and a liquid-fuel sustainer motor to deliver a warhead to airborne targets.

The Ajax missile was gradually replaced by the Nike Hercules missile, introduced in 1958. Like the Ajax, the Hercules was a two-stage missile, but it differed from the Ajax in that its second stage was a solid-fuel rather than liquid-fuel power source and its payload often was a nuclear rather than conventional warhead. Ajax-to-Hercules conversions occurred between 1958 and 1961 and required little change in existing Nike battery facilities. A third-generation missile, the Zeus, was phased out during development and consequently was never deployed.

A typical Nike missile battery consisted of two distinct and separate operating units, the launch operations and the integrated fire control (IFC) operations. The two operating areas were separated by distances of less than two miles, with lines of sight between them for communications purposes. A third separate area was also sometimes part of the battery. This area was typically equidistant from the two battery operating sites and contained housing for married personnel assigned to the battery. Occasionally, these housing areas also contained battalion headquarters, which were responsible for a number of Nike batteries.

Depending on area characteristics and convenience, the housing areas were often reliant on the launch or IFC sites for utilities such as potable water, electrical power, and sewage treatment. In those instances, buried utility lines connected the housing area to one or both of the other battery properties. It is also possible, however, that housing areas were completely independent of the missile launcher and tracking operations. In those instances, the necessary utilities were either maintained on the housing site or purchased from the local community. In many localities, as the character of the land area around the housing units changed from rural to suburban or urban, communities extended utility services to the housing unit locations, in which case conversions from independent systems to community systems were made.

A large variety of wastes was associated with the operation and maintenance of Nike missile batteries. Normally encountered wastes included benzene, carbon tetrachloride, chromium and lead (contained in paints and protective coatings), petroleum hydrocarbons, perchloroethylene, toluene, 1,1,1-trichloroethane, 1,1,2-trichloroethane, and trichloroethylene. Because of the rural locations of these batteries, and also because very few regulatory controls existed at that time, most of these wastes were managed "on-site." (Unused rocket propellants and explosives, however, would always have been returned to central supply depots and not disposed of on-site.) It is further conceivable that wastes generated at one of the Nike properties may have been transferred to its companion property for management or disposal.

Wastes related to missile operation and maintenance would not have been purposely transferred from a battery operating area to a housing area with no facilities for waste management or disposal. In some instances, however, the sewage treatment facilities for all Nike battery properties were located at the housing area; that possibility cannot be automatically ignored. Finally, where housing areas received various utilities from either of the operating areas, it is also possible that wastes disposed of on those other properties may have migrated to the housing area via the buried utility lines. And since decommissioning of the Nike batteries did not normally involve removal of buried utility or communication lines, any such contaminant migration is likely to have gone unnoticed.

### **2.3.2 Livingston Housing Units**

The Livingston housing units were built in 1956 to provide stand-alone family housing for military personnel assigned to the Nike battery. Thirty-two single-family houses, a well, pumphouse, water tank, and wastewater treatment plant were erected on the property. After decommissioning of the Nike battery in the early 1970s, the area has continued to be used as housing for active-duty military personnel.

Since the initial property development in 1956, no other permanent structures have been added, and none of the original structures has been razed. However, renovations have taken place. These include the replacement of sidings, exterior insulation, gutters, fascia, and splash blocks, and the painting of all exterior trim in 1982; the replacement of windows, roofing, and storage sheds in 1985; and the replacement of flooring in the units during changes of tenants over the past 5 to 10 years.<sup>4-6,11</sup>

## **2.4 ENVIRONMENTAL SETTING AND SURROUNDING LAND USE**

The Livingston housing area is located in an area of commercial and residential development. The local topography is relatively flat, although the south side of the property slopes downwards towards the south. Surface drainage is in a generally southerly direction.

The former missile-launch area of the old Nike battery is just north and west of the housing area across the access road; this area is clearly shown in aerial photographs taken in March 1988.<sup>4</sup> In addition, a small parcel of land lying between part of the

housing area and the access road was also part of the former Nike operating facility and contains an old barracks building. This parcel of land is currently unused and covered by a thick growth of weeds; the building is in poor condition and clearly has not been occupied for a long time. Neither of these areas has been developed since being exscessed in 1975, and both of them may still be under the control of the General Services Administration, although this could not be verified.

Immediately west of the housing area is a small piece of wooded land. South of the area lies a heavily developed commercial area that borders New Jersey State Rt. 10. East of the housing area and west of River Road lies mostly undeveloped land. To the northeast, across the access road, is a small residential area.

## **2.5 GEOLOGIC AND HYDROLOGIC SETTINGS<sup>12-14</sup>**

The Livingston housing area is located in the Triassic Lowland section of the Piedmont Physiographic Province, characterized in northern New Jersey by generally low relief with a regional eastward slope. In this area, rocks of the Newark Group (shales and sandstones fractured by normal faulting) are interbedded with basalt flows and intruded by diabase dikes and sills.

The Livingston housing area lies within that portion of New Jersey that was covered by glaciers during the most recent (Wisconsinan) glacial period. A variety of glacial deposits, both stratified and unstratified, are common throughout the area, but these deposits are highly variable in both thickness and location.

Groundwater in the vicinity of the Livingston housing area is drawn primarily from the Triassic sandstones and shales of the Newark Group, although aquifers associated with glacial valley-fill deposits are also important in northern New Jersey. Aquifers in this area are commonly interconnected with surface water sources.

### **3 ENVIRONMENTALLY SIGNIFICANT OPERATIONS**

#### **3.1 UNDERGROUND FUEL-STORAGE TANKS**

Each unit has a 275-gallon underground fuel oil tank behind the house. The fill pipe is also located behind each house. Minor amounts of soil discoloration as well as stunted plant growth were observed near some of the fill pipes examined. Although no documentation was found that recorded failures or suspected leaks at any of these tanks, real property records show that they are original equipment and therefore more than 30 years old. Also, no documentation was found to indicate that any type of corrosion-prevention measures were adopted when these tanks were installed. The potential for environmental risk because of leakage from corroded tanks is significant.

#### **3.2 TRANSFORMERS**

The electrical service to the Livingston housing area is provided by a local public utility, but on-site transformers are the responsibility of the Army. No record of any inspection of these transformers for leakage or of any testing of their contents for the presence of PCBs was found. However, no evidence of spills or leaks was observed during the site visit.

#### **3.3 ASBESTOS**

The original floor tiles used in the Livingston houses are believed to have contained asbestos. Although the old flooring has been systematically replaced over the past 5 to 10 years whenever a change of tenant occurs, a few units may still have original flooring.<sup>6</sup>

#### **3.4 UTILITY CONNECTIONS WITH FORMER MISSILE-LAUNCH AREA**

As indicated above, potable water and sewage-treatment service are provided by on-site facilities. Although documentation no longer exists to show any buried utility connections between the adjacent former launch area and the housing area, it is reasonable to presume that these services were at one time provided to the launch area from the same on-site facilities, and that buried lines still exist. It is possible that missile-related contaminants may have migrated along the old buried utility lines into the housing area. The elevations of the launch and housing areas are nearly equal.

#### **4 KNOWN AND SUSPECTED RELEASES**

No major releases or impacts to the environment are known to have occurred at the Livingston housing area. No hazardous wastes or other hazardous materials are stored on-site.

No documentation of known or suspected releases from the underground fuel-oil storage tanks could be found.

Original floor tiles in the housing units may have contained asbestos. However, most of the floor tiles have been replaced in recent years with nonasbestos substitutes. There is no record of problems with deterioration of asbestos-containing tiles. It is unclear how many of the units may still contain original floor tiles.

## 5 PRELIMINARY ASSESSMENT CONCLUSIONS

Although these housing units were originally developed in support of a Nike missile battery, no missile-related wastes were ever delivered to this property for management or disposal. However, since this property was in all likelihood connected with the adjacent missile-launch area of the local Nike battery by buried potable water and sewage lines, missile-related contaminants could have migrated along the buried lines.

The original flooring material in these housing units is believed to contain asbestos. Although a program for the systematic replacement of the old flooring has been ongoing for several years, the possibility exists that original flooring remains in a few units.

Real property records also indicate that the original heating oil tanks installed at each unit are still in service. Assuming an expected lifetime of approximately 20 to 25 years, these tanks should be considered as being at or near the end of their useful life. Furthermore, since none of these tanks was installed with any type of corrosion prevention measures, it can be assumed that the likelihood of leakage from some of these heating oil tanks is high. Since integrity testing has never been performed on any of these tanks, conclusive statements regarding releases of stored product from any of them are not possible.

Although electrical service is provided to the Livingston housing area by a local public utility, the on-site transformers are the original ones installed when the housing area was built in 1956. The Army has had responsibility for their inspection and maintenance from that time until the present. No test for the presence of PCBs in these transformers has ever been conducted, nor are the transformers routinely inspected for leakage, although no such leakage was apparent at the time of the site visit.

## 6 RECOMMENDATIONS

Because the original underground heating-oil tanks are still in place at this property, and assumed to be near or at the end of their expected useful life, it is recommended that all underground tanks be removed and replaced with new tanks. It is also recommended that soil be taken from all portions of the tank excavations and tested to identify any contamination present.

On-site electrical transformers should be inspected for possible leakage. It is also recommended that all existing transformers as well as the soil at the base of transformer poles be tested for the presence of PCBs; that transformers be labeled as to their contents; and that any soil contamination found be remediated as required.

Since the housing area is probably connected by buried utility lines to land that was at one time part of the Nike launch area, it is recommended that soil samples from along these lines be tested for the presence of missile-related contaminants.

These recommendations assume that this property will most likely continue to be used for residential housing.

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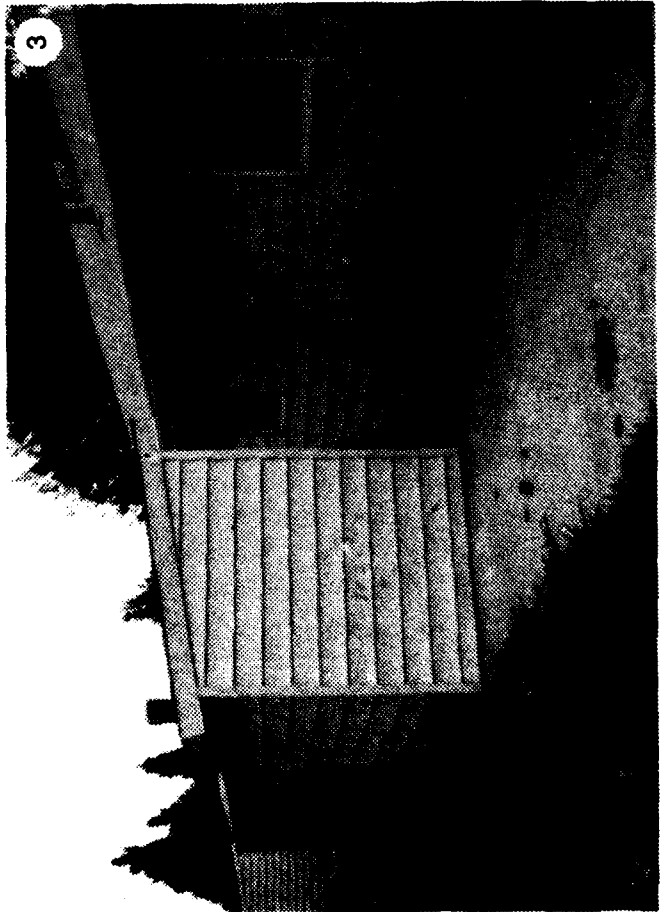
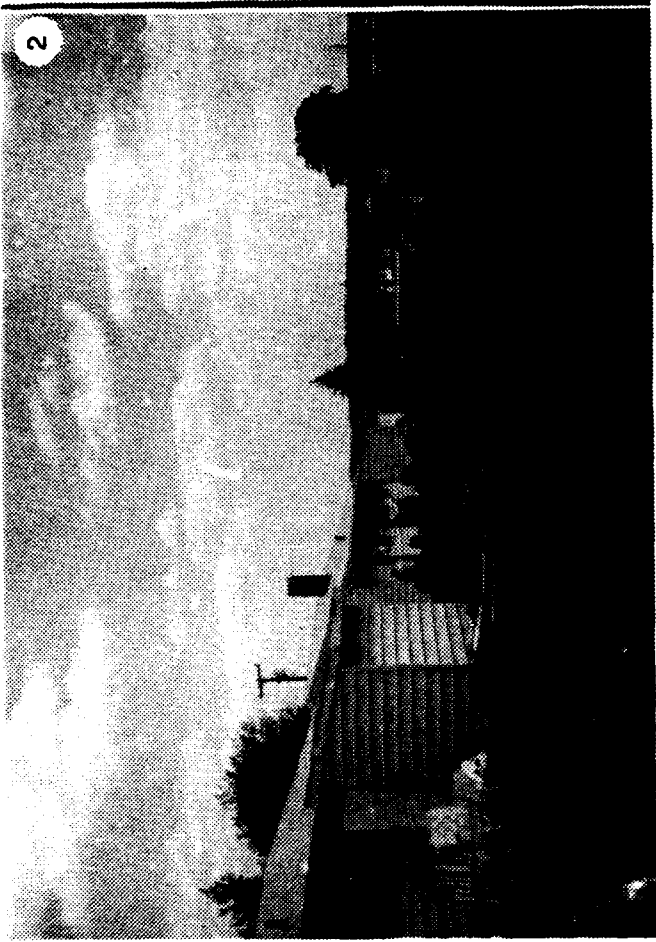
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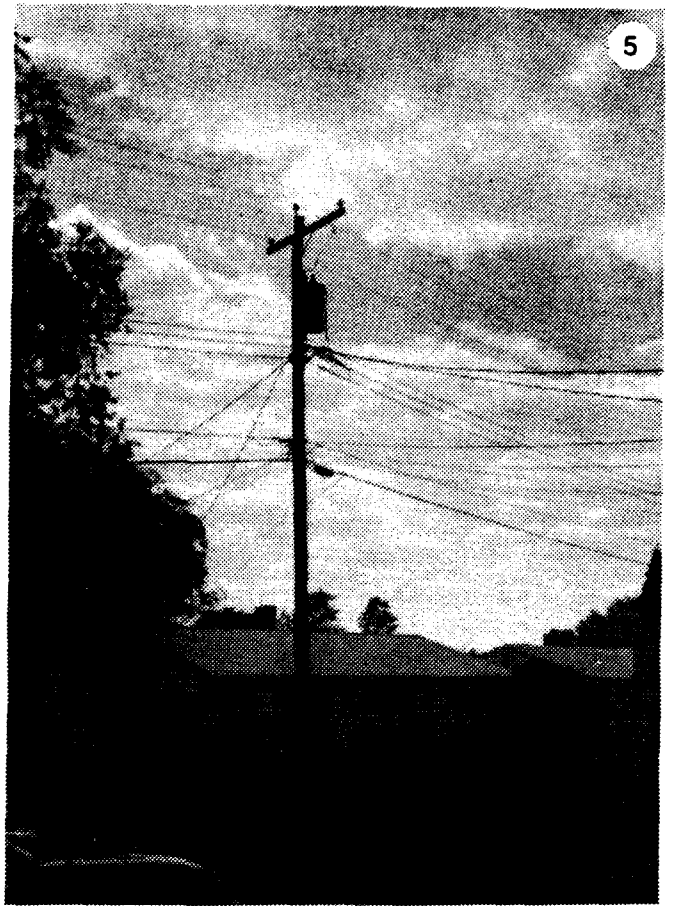
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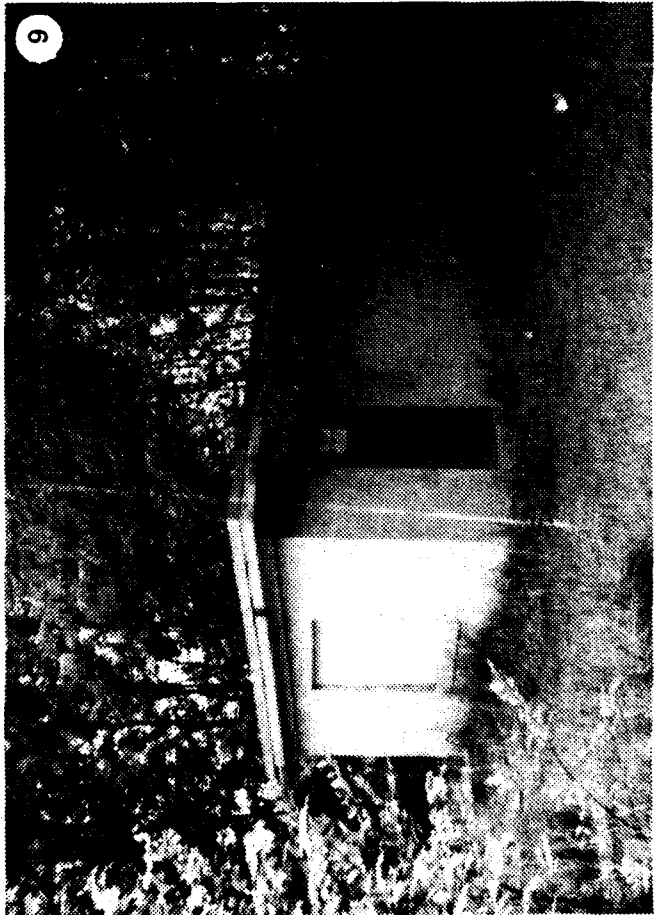
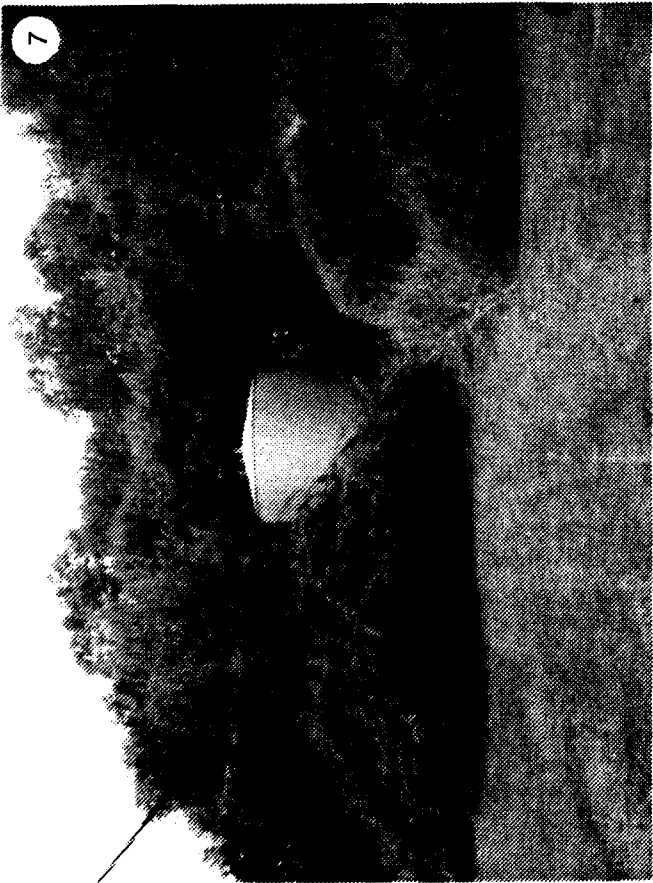
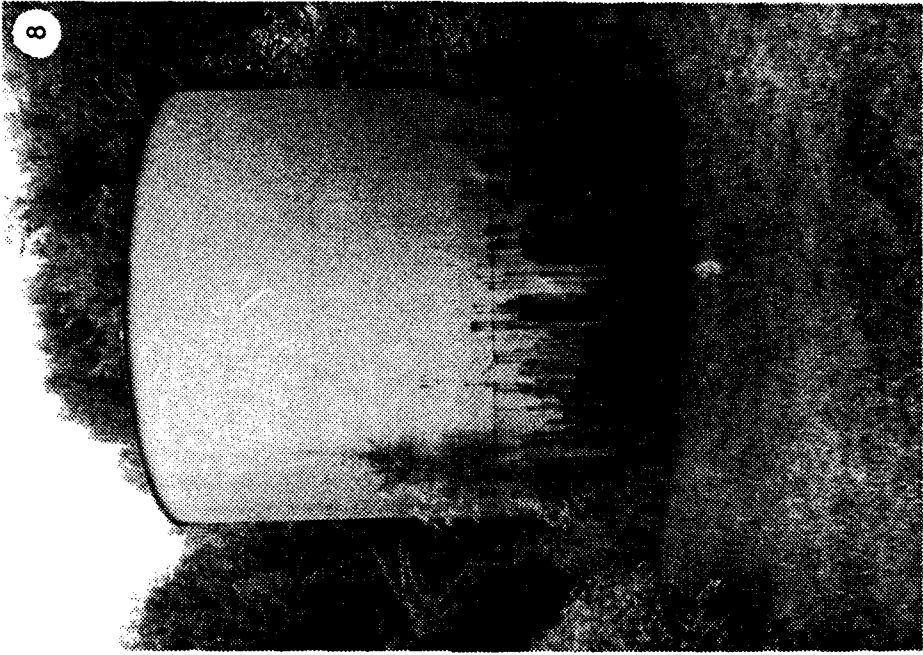


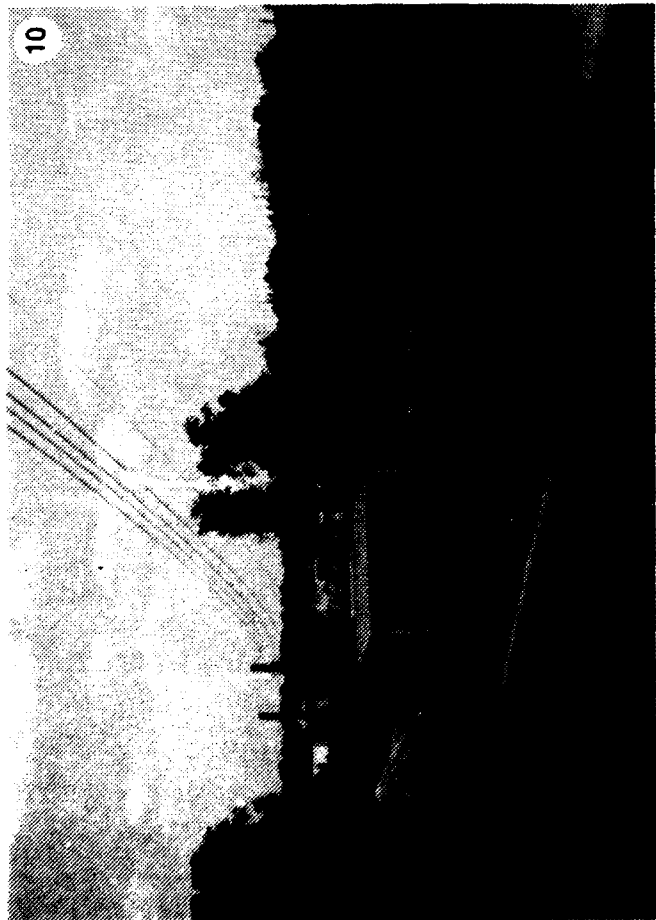
**APPENDIX:**  
**PHOTOGRAPHS OF LIVINGSTON HOUSING FACILITY**  
**AND SURROUNDING LAND**











**IDENTIFICATIONS OF PHOTOGRAPHS**

1. The front of a Capehart housing unit, with wooded area behind it.
2. Back yards of a row of houses, looking east; area's sewage-treatment plant at far rear in view.
3. The fill pipe of an underground fuel-storage tank, located on the rear patio of this house.
4. A fill pipe for an underground fuel-storage tank, with stressed area around the pipe; it is not clear whether the lack of vegetation is due to oil spills.
5. Utility pole in front of a housing unit; transformers atop the pole belongs to the U.S. government.
6. Closer view of the transformers.
7. Water tank at the housing area.
8. Closer view of the water tank.
9. The pumphouse building at the site.
10. The site's sewage-treatment, behind the fenced area.
11. An abandoned building on land adjacent to the housing area; the adjacent tract formerly was a missile-launch area for the old Nike battery.
12. Beyond the playground shown here, and south of the housing area, heavily developed commercial property and a heavily traveled highway (Rt. 10).