ARGONNE NATIONAL LABORATORY
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**Preliminary Assessment Report for
Olney Military Reservation,
Installation 24175,
Olney, Maryland**

Prepared for

National Guard Bureau,
Army Directorate
Aberdeen, Maryland

July 1993

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Acronyms

ARNG	Army National Guard
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
DEP	Department of Environmental Protection
DNR	Department of Natural Resources
EPA	U.S. Environmental Protection Agency
ESO	environmentally significant operation
IRP	Installation Restoration Program
PA	preliminary assessment
PCB	polychlorinated biphenyl

**Preliminary Assessment Report for
Olney Military Reservation,
Installation 24175,
Olney, Maryland**

Summary

This report presents the results of the preliminary assessment (PA) conducted by Argonne National Laboratory at the Maryland Army National Guard property near Olney, Maryland. Preliminary assessments of federal facilities are being conducted to compile the information necessary for completing preremedial activities and to provide a basis for establishing corrective actions in response to releases of hazardous substances. The principal objective of the PA is to characterize the site accurately and determine the need for further action by examining site activities, quantities of hazardous substances present, and potential pathways by which contamination could affect public health and the environment. This PA satisfies Phase I of the U.S. Department of Defense Installation Restoration Program for Olney Military Reservation property.

Olney Military Reservation is an 8-acre site located in the southwestern portion of Maryland, about six miles northwest of Washington, D.C., in Montgomery County. The major facilities included in this PA comprise the administration building, barracks, and motor repair shops. The environmentally significant operations associated with the property are underground and aboveground storage tanks, a vehicle wash rack, a flammable materials storage area (a lean-to structure), and a hazardous materials storage building.

The review of both historical and current practices at the property indicates that Olney Military Reservation property poses no immediate threat to human health or the environment. Argonne's reviewers noted several historical potential threats to the environment that have occurred at the property that installation personnel have corrected or eliminated.

1 Introduction

This document is a report of the preliminary assessment (PA) conducted by Argonne National Laboratory at the Maryland Army National Guard (ARNG) property known as Olney Military Reservation, also called the Olney Armory (formerly Nike Missile Battery W-93 Barracks Area), located at 5115 Riggs Road, Olney, Maryland. This property, together with separate missile launcher and integrated fire control areas, made up Nike Missile Battery W-93. A more complete differentiation of the components of Battery W-93 appears in Section 2.3. This assessment is confined to the property formerly used as the barracks area of W-93.

1.1 Authority for the Preliminary Assessment

The National Guard Bureau, Army Directorate, has engaged Argonne to perform PAs of selected ARNG properties. These assessments are being performed in a manner consistent with both the U.S. Department of Defense Installation Restoration Program (IRP) and the U.S. Environmental Protection Agency's (EPA's) Potential Hazardous Waste Site Preliminary Assessment Guidance (EPA 1991). Preliminary assessments of ARNG properties are conducted under the authority and direction of the IRP; the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or, more commonly, Superfund); and the Superfund Amendments and Reauthorization Act of 1986 (Public Law 99-499).

1.2 Objectives

This PA report is based on existing information from the ARNG records that were made available to Argonne investigators and from other sources. Although this PA effort did not generate new data, it does identify areas where existing data are incomplete, unreliable, or ambiguous; this PA also recommends ways to address such shortcomings.

The objectives of the PA are to satisfy Phase I of the IRP and to:

- Identify and characterize the environmentally significant operations (ESOs),
- Identify property areas or ESOs that may require a site investigation,

- Identify ESOs or areas of environmental contamination that may require immediate removal,
- Identify properties for which no further action is needed, and
- Provide information sufficient to prescore the site with the EPA's PA Scoresheets (September 1991).

1.3 Procedures

The PA began with a review of available documents at the Maryland ARNG Headquarters in Baltimore, Maryland, on November 7, 1988. At a follow-up visit on March 16, 1993, current information was obtained regarding the status of the facility. Additional information was obtained through interviews with facility personnel and through site observations. Other information was obtained from the U.S. Geological Survey, Baltimore, Maryland, and from the Maryland ARNG State Environmental Specialist. Information on the general environmental characteristics of the area was obtained from officials of the Montgomery County Solid Waste Authority during visits to their offices in Shady Grove and Rockville, Maryland, on February 15, 1989, and in follow-up discussions. Additional general environmental information was obtained from officials of the Montgomery County Department of Environmental Protection (DEP).

1.4 Report Format

This PA report presents a summary and evaluation of the data relevant to the PA for this property. Section 2 describes the property and its surrounding environment and land uses. Section 3 identifies and characterizes the ESOs at the site. Section 4 discusses known and suspected releases to the environment, and Section 5 discusses potential human and environmental receptors for such releases. Section 6 summarizes the findings and conclusions, discusses the quality and reliability of the supporting information, identifies areas requiring further action, and (as appropriate) suggests how such actions can be accomplished. Section 7 lists pertinent materials reviewed. The Appendix gives interview information.

2 Property Characterization

2.1 General Property Information

Olney Military Reservation is located at 5115 Riggs Road in Montgomery County, Maryland, approximately 6 miles northwest of Washington, D.C., and 18 miles southwest of Baltimore, Maryland. The property was originally developed as the barracks area for Nike Missile Battery W-93. Currently, the property is being used as an armory for Company B of the 115th Infantry Battalion of the Maryland ARNG. The general location of Olney Military Reservation is shown in Figure 1. A site plan for the property is shown in Figure 2. Additional pertinent property information is included in Table 1.

2.2 Description of Facilities

Five permanent major structures are on the property. The original building designations during active Nike Missile Battery activities are still retained: Administration-1A, Administration-1B, Mess Hall-1C, Motor Repair Shop H-10, and Motor Repair Shop H-12. The original property also contained a small flammable material storage building south of H-12, a flammable materials storage area (a "lean-to" structure) west of H-10, a vehicle wash rack west of the motor repair shops, a sewage treatment facility in the northwestern corner of the property, and a pump house and elevated water storage tank south of the Administration-1B building. A hazardous materials storage structure south of H-12 was added later.

At present, armory activities are conducted primarily in the Administration-1A building. Administration-1B is used occasionally for troop billeting during weekend training activities conducted monthly. The Mess Hall, still equipped with food preparation facilities, is occasionally used during weekend training. The motor repair shops have been converted to equipment storage buildings. The vehicle wash rack adjacent to the motor repair shops is no longer used (Cole 1993).

FIGURE 1 General Location of Olney Military Reservation

FIGURE 2 Site Plan for Olney Military Reservation

TABLE 1 Identifying Information for Olney Military Reservation

Installation address	5115 Riggs Road Montgomery County Olney, Maryland 20760
Geographic location	
Latitude	39° 08' 00" N
Longitude	77° 13' 00" W
Description	Tax Map HV, Grid HV 21, Parcel 220 (Legal Description by the Maryland State Department of Assessments and Taxation.)
FISP^a installation number	24175
Commander	CPT Rick McCoughney
Types of facilities	Armory (ARM) Army Training Facility (ATF)
License information	No. DACA-31-3-71-524
Principal contact	1 LT Chris Cole Maryland ARNG Fifth Regiment Armory 29th Division Street Baltimore, Maryland 21201 (410) 576-6132

^a Facility Inventory and Stationing Plan.

Electrical power is supplied by Potomac Electric Power Company. Six electrical transformers are located on two poles near the entrance to the property, off Riggs Road. These transformers were tested for polychlorinated biphenyls (PCBs) in July 1989, and the results showed no PCB contamination (Emmorton 1989).

A drinking water well is still in use for nondrinking purposes; however, the Montgomery County government began providing bottled water to the facility in 1992 because low levels of several organic constituents were detected in local domestic wells (Montgomery County DEP 1992a). Adjacent to the well is the elevated water storage tank, which is no longer used.

Sewage treatment facilities at the property consist of a septic tank, parallel sand filters, and a final chlorinator. The capacity of this treatment facility is greater than what is needed to support

the current armory and weekend training activities that occur at the property. Montgomery County DEP officials reported that no discharge to the receiving stream has been observed from this treatment facility since 1976 (Caldwell 1989).

2.3 Property History

Olney Military Reservation was first developed by the Army in 1955 as the barracks area of Nike Missile Battery W-93. The missile launcher area of this battery is located approximately 0.5 mile northwest of this site along Riggs Road. The launcher area is currently being used as a communications and command center of the Civil Defense Administration, the Federal Regional Center, and is not under Maryland ARNG control. See Figure 1 for the relative locations of the Federal Regional Center and Olney Military Reservation. The integrated fire control area for W-93 is located approximately 0.75 mile east of the site. The integrated fire control area is currently abandoned and also not under the control of the Maryland ARNG. The Maryland ARNG had operational control of Nike Missile Battery W-93 in the years just preceding its decommissioning, but administrative control of this and all other Maryland Nike batteries was retained by the Army throughout the Nike program.

All major structures currently on the site represent the original development of the site. Records indicate that this site was used only as a barracks area throughout the entire life of Nike Battery W-93. Although some minor vehicle maintenance took place in either of the two shop buildings, no other maintenance activities associated with Nike missile batteries occurred at this site.

Although the exact date is not known, Nike W-93 was probably decommissioned in 1972. At that time, all three Nike W-93 properties were deeded to the state of Maryland. Shortly thereafter, the Maryland ARNG took possession of the barracks property. It is believed that, for some time after property acquisition, the Maryland ARNG continued to use the shop buildings for minor vehicle maintenance. This activity has since stopped, and the two repair shops were converted to storage buildings for equipment belonging to the ARNG units assigned to this armory.

No major construction or demolition has occurred at this property since it was acquired by the Maryland ARNG. One 5,000-gal underground gasoline storage tank believed to have been installed during original construction of the Nike barracks was removed in 1991. Two 1,000-gal

and one 1,500-gal underground heating oil storage tanks were removed in March 1993 (Gutierrez 1993).

A typical Nike battery consisted of two distinct and separate operating units, the missile launcher area and the integrated fire control area. The two areas were usually separated by less than two miles. A third area containing barracks facilities was also sometimes included in a battery. The Olney site was typical of this arrangement.

Deactivation of the Nike batteries normally did not provide specific directives for disposal of chemicals (outside of rocket fuels, warhead explosives, or vehicle fuels); therefore, it is speculated that chemical disposal was at the battery commander's discretion. This may have included on-site disposal in landfills or infiltration basins, disposal in local landfills, or simply discharging materials onto the ground or into nearby ditches or watercourses.

Generic information on the Nike Missile program has been compiled by both the Army Corps of Engineers (LEG Government Services Division 1986) and the U.S. Army Environmental Center (formerly the U.S. Army Toxic and Hazardous Materials Agency) (McMaster 1984). Some information about the Nike defense program remains classified for reasons of national security. However, in compiling the information, independent contractors relied on information contained in unclassified documents related to the Nike Missile program including engineering drawings and specifications (for the Nike facilities and the missiles themselves), interviews with Army personnel participating in the Nike program, and operations manuals and directives relating to the operation and maintenance of Nike facilities.

Although comprehensive in nature, both reports note the paucity of specific information regarding the generation and subsequent disposal of wastes associated with Nike missiles. When they could be found, the field manuals, deactivation plans, and operational reports filed by the individual installations did not address waste management to any great extent.

2.4 Permitting Status

Olney Military Reservation applied for a National Pollutant Discharge Elimination System permit in 1984 to meet any discharge requirements that may have resulted from the property's sewage treatment facilities. According to the Maryland Department of Health and Mental Hygiene,

a permit was unnecessary and therefore was never issued (Ashby 1993). The discharge situation has not changed since 1984.

2.5 Surrounding Environment and Land Uses

2.5.1 Demographics and Land Use

Montgomery County is located in the southwestern portion of Maryland, northwest of Washington, D.C. In recent years, Montgomery County has experienced rapid growth in service industry sector jobs and in high-tech industries. The 1980 census reported a county population of 579,053 (Montgomery County DEP 1987). The Montgomery County Office of Economic Development estimated the 1991 population at 768,000.

Present zoning around Olney Military Reservation is characteristic of the agricultural/rural setting that predominates throughout much of Montgomery County, with scattered homes, wooded and open tracts, farms, and recreational facilities surrounding the site. Land surrounding Olney Military Reservation is zoned for residential development.

The Oaks Sanitary Landfill is located about 0.5 mile southwest of Olney Military Reservation. The facility was constructed in 1981 and began operation in June 1982. The site covers 550 acres; approximately 200 acres are permitted for filling operation under the current permit, and the remainder serve as a buffer zone surrounding the active site. Before approval of the current expansion, the fill area covered approximately 128 acres (Montgomery County DEP 1992b). The active portions are surrounded by earthen berms that rise an average of 40 ft above the surrounding terrain. These berms provide site and sound isolation for the disposal activities as well as run-off and run-on control for the disposal trenches. Thus, although surface drainage throughout the area is generally to the north and east (thus placing Olney Military Reservation in the apparent downgradient direction from the landfill), runoff from the disposal site is redirected to a neighboring watershed and is no longer flowing toward Olney Military Reservation property (Montgomery County DEP 1987). The landfill is projected to close in 1996. Both on-site and off-site groundwater monitoring programs to monitor the landfill's influence on area groundwater have existed since 1980. Additional discussions on previous and current monitoring activities are found in Section 4 (Caldwell 1993).

2.5.2 Climate

Climate information is excerpted from Dames and Moore (1978). The climate of the Montgomery County area is classified as humid continental; the weather is highly variable within four distinct seasons. Summer temperatures average from 80 to 90°F, with high humidity because of the warm, moist air entering the area from the south. Temperatures exceed 90°F an average of 31 days per year. Winters are mild, with daytime highs averaging from 40 to 50°F; however, occasional polar air masses can bring temperatures below freezing an average of 100 days per year.

Precipitation in the area is moderate and evenly distributed throughout the year, with an annual average of 40.5 in. Monthly precipitation extremes for the area range from 18.35 in. to less than 0.5 in. Snowfall occurs an average of 25 days per year, with freezing rain occurring two to three times per year, usually in January and February. The greatest 24-hour rainfall and snowfall events were 7.82 and 24.5 in., respectively.

Severe weather occurrences are infrequent. Tornadoes rarely occur, and thunderstorms occur an average of 28 days per year, generally between May and August. Tropical storms sometimes affect the area with high winds and heavy rainfall.

The prevailing wind is from the west at average speeds of 9.5 miles/hour. The highest wind speed occurs during winter and spring.

2.5.3 Surface Water and Physiography

Olney Military Reservation is located in the Hawlings River watershed. The Hawlings River is an east-southeast-flowing tributary to the Patuxent River. Drainage from Olney Military Reservation property is generally east-northeast along grassy swales or shallow ditches to an unnamed north-flowing tributary of the middle branch of the Hawlings River. From the entry point of this tributary, the Hawlings travels approximately five river miles east-southeast before combining with the Patuxent. The confluence of the Hawlings and the Patuxent rivers is approximately one river mile downstream of the Triadelphia Reservoir. The total area of the Hawlings River watershed is approximately 14.70 square miles (Dames and Moore 1978).

Because of their general characteristics, surface water streams in this area have not traditionally been relied upon as sources of potable domestic water supplies, although there is some reliance on surface streams for domestic livestock watering.

2.5.4 Geology

2.5.4.1 Regional Geology

Maryland comprises five major geologic provinces: Appalachian Plateau, Ridge and Valley, Blue-Ridge, Piedmont, and Coastal Plain (Maryland Department of Natural Resources [DNR] 1987). Olney Military Reservation lies within the Piedmont Geologic Province. The Piedmont Province is a rolling plateau that extends westward from the Fall Line to Catoclin Mountain. The Fall Line is an imaginary southwest-northeast trending line marking the transition from the unconsolidated sediments of the Coastal Plain Geologic Province to the higher elevations of metamorphic and crystalline rocks of the Piedmont Geologic Province. The Fall Line passes approximately 10 miles south of Olney Military Reservation at its closest point. Figure 3 shows the geologic provinces, the approximate locations of the Fall Line, and Olney Military Reservation (Maryland DNR 1987).

2.5.4.2 Local Geology

The area around the site is underlain by metamorphic rocks of the Wissahickon and Sykesville formations. The Wissahickon Formation comprises metamorphosed sedimentary rocks that have been converted through heat and pressure to mica schist, quartzite, metasiltstone, metasandstone, and other schist and gneiss. The principal structural characteristic of this formation is its tendency to break in a preferred direction (foliation). Most foliation has developed parallel to the sedimentary bedding planes. In the area of the site, the bedding planes strike generally N20°E and dip at angles close to vertical.

The Sykesville Formation consists of pebble- and boulder-bearing, sandy to shaley metamorphic rocks, ranging from weakly gneiss-like to strongly foliated gneiss and schist. In contrast to the highly foliated Wissahickon Formation, the Sykesville Formation is generally unstratified. The transition between these two formations occurs very close to Olney Military

FIGURE 3 Geological Provinces, Fall Line, and Olney Military Reservation

Reservation, along a line that generally parallels Zion Road. Although the transition between lithologies is gradual, Olney Military Reservation is believed to lie completely over the Sykesville Formation. Furthermore, a theory has been advanced that the transition between formations appears gradual only because of a thick soil mantle over the bedrock and that the transition instead occurs rapidly at a major fault that separates the two bedrock formations, again roughly along the line formed by Zion Road (S.S. Papadopoulos and Associates 1982).

Throughout much of northeastern Montgomery County, the metamorphic bedrock is overlain by a capping of clayey materials, termed saprolite, formed by the weathering of bedrock in place. The crystalline bedrock consists largely of feldspar and quartz. Where exposed, the feldspar, in contact with percolating soil moisture and groundwater, is subject to solution action and converted to clay minerals, chiefly kaolinite. This solution action results in an unconsolidated to poorly consolidated material consisting mostly of clay, silt, and sand-sized fragments of quartz and rock fragments. Saprolite generally grades from a predominantly clayey material showing little

structure at the land surface, downward through silty, slightly to well structured material into fresh bedrock. The rate of saprolite formation is highly variable, depending on local topography, drainage conditions, and character of the bedrock. As a result, the thickness of the saprolite layer varies greatly throughout the area from as little as a few inches or less (where bedrock outcrops the surface) to as much as 45 ft.

2.5.5 Groundwater

2.5.5.1 Regional Hydrogeology

Three distinct hydrogeologic units exist within the Piedmont Geologic Province (Maryland DNR 1987). Hydrologic Unit I contains the most productive aquifers and comprises mainly carbonate rocks that have a fairly high degree of permeability because of weathering. The two main carbonate types are limestones of the Frederick Valley and Piedmont marbles. The Frederick Valley contains two water-bearing formations, the Frederick Limestone Formation of Cambrian age and the Grove Limestone Formation of Ordovician age. The Piedmont marbles consist of the Wakefield Marble and the Cockeysville formations. None of these limestone or marble formations occur near Olney.

Hydrologic Unit II compresses schists and quartzites of the central Piedmont in two main formations, the Wissahickon and the Marburg. The Wissahickon is the water-bearing formation principally relied on for domestic water in the Olney area.

Finally, Hydrologic Unit III includes schists, phyllites, gabbros, and some sandstones and shales. Some of the formations represented in this unit include Gettysburg Shale, New Oxford Formation, Ijamsville Formation, Urbana Phyllite, Baltimore Gabbro Complex, Setter Formation, and Baltimore Gniess. None of these formations are currently relied upon to supply water in the Olney area.

Natural water quality in Piedmont aquifers is generally satisfactory; however, dissolved iron concentrations may be high locally (0.3 ppm or greater). Water is relatively soft in most Piedmont aquifers, although water recovered from limestone, marble, and some Triassic sandstone aquifers tends to be harder. Total dissolved solids are usually low, and pH ranges between 6.0 and 8.0 (Maryland DNR 1987).

The primary interstitial porosity of the metamorphic bedrock is generally less than 1% void space. Consequently, most groundwater occurs in fractures such as foliation cracks and faults. Fracture openings are widest and most numerous near the upper surface of the bedrock, decreasing in both size and frequency with depth. Fractures are not present below about 300 ft. Thus, groundwater is virtually unavailable at or below this depth (Maryland DNR 1987).

In contrast to the undisturbed bedrock, the overlying saprolite tends to have high interstitial porosity (i.e., void space), typically ranging from 30 to 50% by volume. This characteristic enables the saprolite to store huge quantities of water. Such high porosity also suggests high degrees of siltation within the saprolite, which, in turn, supports the observed low subsurface water flow rates in the saprolite zones. Hydraulic continuity between water in the shallow bedrock and water in the saprolite is indeed possible, primarily because of fluctuating bedrock water table levels. Thus, contaminants released into the saprolite may be "leached" from the saprolite by underlying bedrock aquifers during periods with elevated and subsequently receding water levels. The saprolite/bedrock interface also is not necessarily horizontal; thus, exchanges of groundwater between these two zones can occur as a result of both vertical and horizontal water movement.

Domestic wells in saprolite-covered areas of Montgomery County are generally drilled into the crystalline bedrock, usually to a depth of 200 ft or less (Maryland DNR 1987). In most well installations, the saprolite zone is cased and cemented to prevent movement of saprolite groundwater into the bedrock aquifer via the well hole. Wells drilled near major faults often encounter large fractures that deliver water at exceptionally high rates.

Aquifer transmissivity is extremely variable in the Piedmont, ranging from less than 100 gal per day per foot to more than 35,000 gal per day per foot. The mean yield of existing Piedmont wells is 9 gal per minute.

Groundwater exists usually under unconfined conditions in both saprolite and shallow bedrock with depths to the top of the water table averaging 30 ft below land surface. However, in some topographic circumstances, artesian water table conditions exist in bedrock aquifers and produce hillside streams and seeps.

2.5.5.2 Local Hydrogeology

Information on the local hydrogeology was obtained from studies conducted at the Oaks Landfill (Montgomery County DEP 1992b) and from water level measurements at nearby facilities. Static water levels measured in wells at the Federal Regional Center averaged 28.5 ft below ground surface (530 ft above mean sea level). Water levels in piezometers installed as part of the site evaluation study for the Oaks Landfill averaged 14 ft below ground surface (509 ft above mean sea level) (Caldwell 1989). Local groundwater flow is towards the north-northeast, with a reported gradient of 0.05 throughout most of the landfill adjacent to the Olney site (Montgomery County DEP 1992b).

Several hydraulic properties of the saprolite and bedrock aquifer were estimated during studies at the landfill. The estimated average permeabilities are 20 and 0.7 ft per day for the saprolite and bedrock, respectively. The reported porosity of the saprolite is 25%, whereas the bedrock has only 2% porosity (Montgomery County DEP 1992b). The estimated average rates of groundwater movement beneath the landfill are 4 ft per day in the saprolite and 0.17 ft per day in the bedrock. An earlier study at the nearby Oaks Sanitary Landfill estimated the groundwater to be flowing at a rate of from 0.00036 to 1.2 ft per day in the saprolite and from 0.05 to 5.7 ft per day in shallow bedrock. Flow direction is generally north-northeast, although the presence of stream beds may locally affect flow directions in uppermost aquifers (S.S. Papadopoulos and Associates 1982).

2.5.6 Sensitive Environments

No sensitive areas or endangered species have been identified in the immediate site vicinity (Maryland DNR 1987).

3 Environmentally Significant Operations

The PA team from Argonne identified six ESOs at Olney Military Reservation: three underground heating/oil storage tanks located west of Administration-1A building (1,000 gal), south of Administration-1B building (1,000 gal), and northwest of the Mess Hall building (1,500 gal); a 750-gal aboveground heating fuel tank that serves the northernmost maintenance shop building (Motor Repair Shop H-10); a vehicle wash rack across from the vehicle maintenance buildings; a flammable materials storage area (a lean-to structure) adjacent to the wash rack; a hazardous materials storage building located south of the Motor Repair Shop H-12; and an underground gasoline storage tank, which has been removed, located west of the maintenance shops.

3.1 Underground Heating Oil Tanks

Two 1,000-gal and one 1,500-gal underground tanks storing heating fuel were removed in March 1993 in accordance with Maryland state requirements. The exact installation dates for these tanks are unknown, but it is presumed that they were installed during initial development of the Nike Battery in 1952. On March 19, 1993, ARNG personnel reported that a 1,000-gal underground heating oil tank located on the southeastern corner of Administration-1B building had developed a leak. Heating oil leaked into the boiler room of Administration-1B building from a broken return fuel line between the tank and the building. A small amount of oil drained from the boiler room into the drain pipe connected to the septic tank, where it was contained in the first chamber. No oil was detected beyond the septic tank. It was estimated that approximately 250 gal of oil leaked from the storage tank, some of which contaminated soil around the tank. The Maryland Department of the Environment was called in to oversee site cleanup. A monitoring well was placed into the contaminated soil, and fuel oil was pumped out. Oil that drained into the septic tank was pumped out, and an oil boom was placed into the tank to capture additional oil and to prevent further contamination of the septic system.

The contaminated soil surrounding the tank was removed, placed on the asphalt parking lot, and treated with nitrogen fertilizer. All three holes were filled with pea gravel and sand. The contaminated area will continue to be monitored by ARNG and the Maryland DEP until there is no further detection. No long-term environmental impact is expected as a result of this leak (Gutierrez 1993).

3.2 Aboveground Heating Oil Tank

The Motor Repair Shop, H-10, is heated by heating oil supplied from an aboveground, 750-gal-capacity heating oil storage tank adjacent to the building's north side. A 0.38-in. copper supply line, buried just beneath the ground surface, delivers oil to the boiler. Heating oil for this building has been stored in this manner since the building's construction in 1952. Installation personnel report that this storage tank has had a history of small leaks in the supply line. In 1982, the supply line was replaced, but the small leaks redeveloped. The oil-contaminated ground surface around the tank was excavated; currently there are no apparent leaks around the supply line (Cole 1993).

3.3 Vehicle Wash Rack

A vehicle wash rack, which is no longer in use, is located adjacent to the lean-to materials storage shed. An outflow drain pipe is connected to the wash rack, and open drainage is located approximately 50 ft east of the sewage treatment facility.

3.4 Flammable Materials Storage Area

This lean-to structure formerly stored paint, oils, and lubricants during the Nike Battery operation. Evidence was found of minor spills on the cement floor; however, no surface migration of spilled materials beyond the storage area was observed. Four 55-gal barrels containing soil contaminated with heating oil were temporarily stored for disposal. These barrels were removed from the site in March 1993 (Gutierrez 1993).

3.5 Hazardous Materials Storage Building

A steel hazardous materials storage building, located adjacent to Motor Repair Shop H-12, currently stores small quantities of various paint, aerosol insecticides, cleaning solvents, and oil supplies. The building appears well maintained, and no evidence exists of spills on the cement floor or contamination outside the building.

3.6 Underground Gasoline Storage Tank

A 5,000-gal gasoline tank located west of the maintenance shops was removed from the facility in December 1991, in accordance with Maryland state requirements. The tank, which was believed to have been installed in 1952, failed a pressure test in 1987, which precipitated its removal. In 1977, a spill of an unknown quantity of gasoline occurred because of an overfilling error. No written documentation on this spill exists, and the details of response and recovery actions (if any) are unknown. No significant environmental impacts are known to have occurred (Romack 1988).

4 Known and Suspected Releases

4.1 Releases to Groundwater

No documented releases of contaminants to groundwater have occurred from the National Guard facility. Since 1980, opportunities have existed to observe releases to groundwater in the vicinity of Olney Military Reservation by virtue of the presence of the Oaks Sanitary Landfill west and south of the site. As part of the site evaluation study that preceded this landfill's development, and for a period during early operation of the landfill, the Montgomery County Health Department maintained a groundwater monitoring and observation well network downgradient of the landfill. Groundwater flow direction in the area is generally north-northeast, putting Olney Military Reservation downgradient of the landfill, so many of the wells in this network were in the immediate vicinity of the ARNG property.

Groundwater samples were recovered regularly from monitoring wells installed specifically for the monitoring study and from existing private drinking water supply wells located in the appropriate downgradient direction. One monitoring well used during this study was actually installed on Olney Military Reservation, off the northwestern corner of the Mess Hall building. This well is still in place but is no longer routinely sampled as a measure of the landfill's performance (Caldwell 1989).

As a result of additional landfill site characterizations, off-site groundwater monitoring of the Oaks Sanitary Landfill was discontinued in 1982 and replaced with a network of wells on landfill property, more immediate to the active fill areas of the landfill (Romack 1988). However, residents near the landfill still concerned about its potential impact to groundwater were still able to request that their private water supplies be sampled.

In April 1992, the county identified the presence of low-level volatile organic compounds in groundwater from wells sampled on the western half of the landfill and some of the domestic wells north and west of the landfill. These results appeared to confirm earlier limited testing performed at the landfill by the Montgomery County DEP (Montgomery County DEP 1992b).

The county is testing monitoring wells monthly. Four contaminated private wells in the area are also tested monthly. All other private domestic wells in the area are tested annually (Caldwell 1993).

No compounds detected in domestic wells are present in concentrations above established drinking water standards. Nevertheless, in recognition of the uncertainty created by this situation and the associated concern it has generated in the community, the county has offered bottled drinking water to residents living within the potential groundwater influence area of the landfill (Montgomery County DEP 1992a). The county is providing Olney Military Reservation with bottled drinking water.

4.2 Releases to Surface Water

No releases to the surface waters have been documented for this property. Regular inspections of the treatment facility indicate that the facility has not discharged measurable quantities to the Hawlings River (the receiving stream designated in the permit) since 1976 (Caldwell 1989).

4.3 Releases to Soil

One release to soil has been documented at Olney Military Reservation. Approximately 250 gal of heating oil leaked from an underground storage tank identified by installation personnel in March 1993 (Gutierrez 1993).

Two undocumented releases to soils of this site have also occurred. Small amounts of oil have leaked at the connection to the aboveground heating oil tank and the supply line leading to the boiler in Building H-10. The leaks resulted in a small area of contamination beneath the storage tank. The contaminated soil has been removed, and no evidence of leaking is now apparent. Also, the overfilling of the underground gasoline storage tank opposite the vehicle maintenance buildings is expected to have released petroleum products to soils in the immediate vicinity of the tank, although there is no documentation of the volume of this release.

4.4 Releases to Air

No releases of contaminants to the air from Olney Military Reservation have been documented. The nature of activities at the property suggests that such air releases would be nominal, resulting primarily from vehicle emissions and emissions from indirect heating plants in each main building.

4.5 Other Releases

No unusual fire or explosion threats exist at Olney Military Reservation.

5 Human and Environmental Receptors

5.1 Groundwater

Virtually the entire population in the immediate vicinity of Olney Military Reservation relies on groundwater, from either private or municipal supplies, for potable water needs. Individual water supplies are the predominant source. The Maryland DNR has estimated the number of water supply wells within a one-mile radius of the facility to be 104. Included in this number are municipal wells, private domestic water wells, livestock and irrigation wells, and industrial use wells. This number does not include those private wells installed before 1969 or wells installed without the required permit (Johnson 1988).

The great majority of wells are finished in the uppermost bedrock rather than in the overlying saprolite. The attenuation potential and the anticipated slow movement of contaminants in the saprolite suggest that no immediate threats to bedrock aquifers exist. However, fluctuating water table levels may allow bedrock groundwater to move into the saprolite zone from below. As the water table level falls, it is likely to take with it some of the contaminants, thus providing a pathway for contamination of the aquifer; consequently, contaminants from that zone can flow back into the bedrock aquifers as the water table levels fall. By such a mechanism, all bedrock groundwater supplies in the area are threatened by contaminant releases to the ground surface or to the saprolite zones.

5.2 Surface Water

As noted in Section 2, streams in the area are generally small, slow-flowing, and intermittent. As a consequence, surface waters are not a reliable source of potable water for domestic purposes. In some cases, these streams are recharged by bedrock groundwater existing under artesian conditions. Streams may also, in some cases, be recharged by groundwater existing in the saprolite zones in nonartesian circumstances. No recreational uses of surface waters occur in the immediate vicinity of Olney Military Reservation. Only livestock use the aquifer waters.

5.3 Soil

Contact with contaminated soils on this property is expected to be quite limited. Access to the entire property is controlled by a perimeter fence and gate, thus limiting the on-site presence of unauthorized personnel. Furthermore, fewer than 10 people are assigned to this facility full time. The facility is routinely used once a month for weekend training exercises for Company B of the 115th Infantry Battalion of the Maryland ARNG. The population at the facility averages about 70 on weekends in which training exercises are conducted (Cole 1993).

5.4 Air

This facility houses no significant sources for airborne contamination. Furthermore, the facility is in a rural setting with scattered private dwellings in the north and east. Areas to the west and south of the facility are buffer areas for the Oaks Sanitary Landfill and, thus, uninhabited.

5.5 Other Receptors

No other ecological receptors have been identified.

6 Preliminary Assessment Findings and Conclusions

6.1 Summary of Preliminary Assessment Findings

No significant adverse impacts to the environment resulting from the current activities at Olney Military Reservation have been identified. Furthermore, historical information suggests that, when this property was part of Nike Missile Battery W-93, it was used only as a barracks area. Therefore, none of the environmentally problematic wastes generally associated with the operation of Nike Missile Batteries would have been generated or handled at this location. However, it is possible that vehicle maintenance wastes may have been generated in small quantities.

Only one condition or event of the past has been identified as having any potential for adverse environmental impacts: the problem of small but repeated leaks from the fuel supply line of the maintenance building's aboveground heating oil tank. The history of intermittent leaks from the heating oil tank supply line suggests the potential for environmental releases off-site. Subsurface migration of petroleum product may have occurred from these leaks. Also, the recent leak from an underground heating oil tank adjacent to building 1B contaminated soil around the tank, and a small amount drained directly into the septic tank; however, the rapid response and cleanup procedures have eliminated the potential for off-site releases.

Finally, any contaminant plume reaching the bedrock groundwater table might affect one or more of the numerous water supply wells operational in the area. Maryland DNR well records indicate that a great majority of the wells in this area are apparently finished in the shallow bedrock rather than in overlying saprolite. Although the ongoing sampling of nearby private wells has not indicated the presence of petroleum products, the presence of a subsurface petroleum contaminant plume cannot be fully discounted.

6.2 Recommendations for Further Action

Olney Military Reservation does not constitute any imminent or substantial threat to human health or the environment. However, some additional investigations under the IRP may be appropriate: identifying any subsurface contamination as a result of the aboveground heating oil tank and the most recent contamination resulting from a leak in the underground oil storage tank.

Additionally, these investigations must establish whether subsurface contamination has remained in the saprolite zones or migrated to underlying bedrock aquifers. These investigations may be supported by programs specific to underground storage tanks or under the IRP.

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Appendix:
Interview Information

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Individuals Interviewed

Three personal contacts
Maryland Army National Guard
Baltimore, Maryland

Three personal contacts
Olney Military Reservation
Olney, Maryland

One personal contact
Montgomery County
Division of Environmental Protection
Rockville, Maryland

Two personal contacts
Oaks Sanitary Landfill
Shady Grove Transfer Station
Shady Grove, Maryland

One personal contact
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**DATE
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