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FINAL

Enhanced Preliminary Assessment
Vint Hill Farms Station
Warrenton, Virginia

Prepared for:

U.S. ARMY ENVIRONMENTAL CENTER
ABERDEEN PROVING GROUND, MARYLAND 21010

Prepared by:

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION
1710 Goodridge Drive
McLean, Virginia 22102

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Aberdeen Proving Ground, Maryland 21010

April 1994

ENHANCED PRELIMINARY ASSESSMENT
VINT HILL FARMS STATION
WARRENTON, VIRGINIA

FINAL

Submitted to:

U.S. Army Environmental Center
SFIM-AEC-BCB
Aberdeen Proving Ground, Maryland 21010-5401

Submitted by:

Science Applications International Corporation
1710 Goodridge Drive
McLean, Virginia 22102

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1710 Goodridge Drive
McLean, Virginia 22102

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13. ABSTRACT *(Maximum 200 words)*

An Enhanced Preliminary Assessment (ENPA) was conducted at Vint Hill Farms Station (VHFS) in Warrenton, Virginia. VHFS is a 701-acre facility located 30 miles west of Washington, D.C. The Installation is used by a variety of tenants to research, develop, produce, and sustain new signalswarfare technology for military intelligence. Based on information obtained during a site visit, a total of 42 areas requiring environmental evaluation (AREEs) were investigated during the ENPA. The AREEs include landfills, vehicle servicing areas, and underground storage tanks (USTs). The results of this ENPA determined that 29 AREEs would require additional investigation to ascertain their impact to the environment. Ten (10) AREEs require no further action. Environmental investigations are currently ongoing at three AREEs at VHFS.

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LIST OF ACRONYMS

AAFES	Army, Air Forces Exchange Service
ACIC	Aeronautical Chart and Information Center
ACM	Asbestos Containing Material
AMC	U.S. Army Materiel Command
AMCP	Asbestos Management and Control Program
APCB	Air Pollution Control Board
AQCR	Air Quality Control Region
AREE	Area Requiring Environmental Evaluation
AST	Aboveground Storage Tank
ATM	Alpha Track Monitor
BLS	Below Land Surface
BOD	Biological Oxygen Demand
BTEX	Benzene, Toluene, Ethylbenzene, and Xylenes
CARC	Chemical Agent Resistant Coating
CECOM	Communications-Electronics Command
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
DDT	Dichloro-diphenol-trichloroethane
DES	Department of Emergency Service
DIA	Defense Intelligence Agency
DOD	U.S. Department of Defense
DRMO	Defense Reutilization and Marketing Office
DWMP	Drinking Water Monitoring Program
EM	Electromagnetic
ENPA	Enhanced Preliminary Assessment
EPA	U.S. Environmental Protection Agency
EPIC	Environmental Photographic Interpretation Center
ESE	Environmental Science and Engineering, Inc.
FHU	Family Housing Unit
GC/MS	Gas Chromatography/Mass Spectrometry

LIST OF ACRONYMS
(continued)

GPD	Gallons per Day
HCFC	Hydrochlorofluorocarbons
HR	Hazard Ranking
HRS	Hazard Ranking Score
IEWD	Intelligence and Electronics Warfare Directorate
I/I	Infiltration and Inflow
IMMC	Intelligence Materiel Management Center
IRP	Installation Restoration Program
LERA	Lead Exposure Risk Assessment
LQG	Large Quantity Generator
MCL	Maximum Contaminant Level
MEK	Methyl Ethyl Ketone
MSL	Mean Sea Level
MT	Maritime-Tropical
NOV	Notice of Violation
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NRC	National Response Center
OWS	Oil/Water Separator
PA	Preliminary Assessment
PCB	Polychlorinated Biphenyl
PDO	Property Disposal Office
ppm	Parts per Million
PRI	Program Resources, Inc.
RCRA	Resource Conservation and Recovery Act
SAIC	Science Applications International Corporation
SPCC	Spill Prevention Control and Countermeasures
SQG	Small Quantity Generator
STP	Sewage Treatment Plant

LIST OF ACRONYMS
(continued)

SWCB	State Water Control Board
TCLP	Toxicity Characteristic Leaching Procedure
TPH	Total Petroleum Hydrocarbons
TSCA	Toxic Substances Control Act
TSS	Total Suspended Solids
USADC	U.S. Army Dental Clinic
USAEC	U.S. Army Environmental Center
USAEHA	U.S. Army Environmental Hygiene Agency
USAF	U.S. Air Force
USAHC	U.S. Army Health Clinic
USATHAMA	U.S. Army Toxic and Hazardous Material Agency
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
UST	Underground Storage Tank
UV	Ultraviolet
UXO	Unexploded Ordnance
VDEQ	Virginia Department of Environmental Quality
VDH	Virginia Department of Health
VHFS	Vint Hill Farms Station
VOC	Volatile Organic Compound
VPDES	Virginia Pollutant Discharge Elimination System
XRF	X Ray Fluorescence

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EXECUTIVE SUMMARY

This report presents the results of the enhanced preliminary assessment (ENPA) conducted by Science Applications International Corporation (SAIC) at the United States government property known as Vint Hill Farms Station (VHFS). ENPAs of Federal facilities are being conducted to characterize environmental impacts of actions occurring at the property and to provide a basis for establishing corrective actions to respond to releases of hazardous substances. The principal objective of this ENPA is to accurately characterize the site to determine the need for any further action by examining site activities, quantities of hazardous substances present, and potential pathways by which contamination would affect public health and the environment. Finally, the results of this assessment will contribute to decisions regarding final closure and ultimate excessing of this property.

The property is a 701-acre site located in the State of Virginia, approximately 30 miles west of Washington, D.C., in Fauquier County. The Installation is used by a variety of tenants to research, develop, produce, and sustain new signals warfare technology for military intelligence. The environmentally significant operations associated with the property are photographic processing, vehicle maintenance, electronic equipment refurbishing, metal etching, sandblasting, and painting.

The facilities evaluated in this ENPA include the 26 sites identified in the U.S. Army Toxic and Hazardous Materials Agency (USATHAMA) Waste Site Report and any other potential areas of concern identified during the site inspection, files search, or interviews. As a result, a total of 42 areas requiring environmental evaluation (AREEs) were investigated during the ENPA. The AREEs are spread throughout the 701-acre property and include landfills, vehicle servicing areas, and underground storage tanks (USTs).

Of the 42 AREEs, it was determined that 29 facilities would require additional investigation to ascertain their impact to the environment. These facilities may have released hazardous materials or wastes to the surrounding soils and groundwater.

Three of the AREEs have known soil and groundwater contamination and are currently undergoing investigation. These facilities are the Intelligence Material Management Center (IMMC) Neutralization Pit; the Army, Air Forces Exchange Service (AAFES) Service Station USTs; and the Auto Craft Shop UST.

Of the remaining 10 AREEs, the ENPA investigation has determined that no further action is necessary for these facilities because there is no evidence of releases of hazardous materials or wastes to the surrounding environment.

1. INTRODUCTION

This document presents the results of the enhanced preliminary assessment (ENPA) conducted by Science Applications International Corporation (SAIC) at the U.S. Army property known as Vint Hill Farms Station (VHFS), located near Warrenton, Virginia.

1.1 AUTHORITY FOR THE ENPA

SAIC has been retained by the U.S. Army Environmental Center (USAEC) to prepare an ENPA report under the authority of Contract DAAA15-91-D-0017, Delivery Order 0006. This work is being performed under the guidance of the USAEC Base Closure Division.

1.2 OBJECTIVES

This ENPA is based on existing information from property records, which were made available to SAIC, and from other sources. Although this ENPA effort does not extend to the generation of new data or sample analysis, it nonetheless identifies those areas where existing data are incomplete, unreliable, or ambiguous, and recommends ways to address such shortcomings.

The objectives of the ENPA are to:

- Identify and characterize the areas requiring environmental evaluation (AREEs)
- Identify property areas or AREEs that may require a site investigation
- Identify AREEs or areas of environmental contamination that may require immediate remediation
- Identify properties for which no further action is needed
- Identify possible impacts to the properties from surrounding activities and land uses.

1.3 PROCEDURES

The initial activities of the ENPA were conducted between September 13 and 17, 1993, and consisted of a review of environmental files located at VHFS. A site visit also was conducted during this time to obtain additional information through direct observation and

interviews with personnel familiar with the property and its operations and history. Other relevant information was obtained later from the following Federal, state, and local environmental agencies:

- EPA Region III, Superfund Division
- Virginia Department of Environmental Quality (VDEQ), Hazardous Waste Division
- Virginia Department of Health, Office of Water Programs
- Virginia State Water Control Board, Underground Storage Tank (UST) Division
- Virginia State Water Control Board, NPDES Division
- Virginia Air Pollution Control Board, Region IV
- Fauquier County, Environmental Health Division.

1.4 REPORT FORMAT

This section presents a summary and evaluation of the data relevant to the ENPA for this property. Section 2 describes the property and its surrounding environment and land uses. Section 3 identifies and characterizes the AREEs at the site. Section 4 discusses known and suspected releases to the environment, and Section 5 discusses potential human and environmental receptors of any such releases. Section 6 summarizes the findings and conclusions and identifies areas requiring further action. Section 7 lists pertinent materials reviewed in preparing this ENPA, and Appendix A lists the persons interviewed during the ENPA, as well as the investigators. Appendix B contains copies of supplemental geological maps pertaining to the physiography, soils, and hydrogeology at VHFS. Appendix C provides a table of all VHFS buildings sampled for asbestos. Appendix D contains copies of supplemental sampling data for soils and groundwater at VHFS. Appendix E provides a copy of the Federal and state data base search.

2. PROPERTY CHARACTERIZATION

2.1 GENERAL PROPERTY INFORMATION

Vint Hill Farms Station (VHFS) covers 701 acres and is located in the north-central portion of Virginia, within the east-central portion of rural Fauquier County, as shown in Figure 2-1. The southern portion of the property consists of approximately 150 acres of improved grounds used for industrial operations, administration buildings, and residential housing. East of this area are 94 acres of mature hardwood forest. The majority of the remaining 116 unimproved and 341 semi-improved acres in the northern portion of the property are used for operations mission activities (i.e., stationary and mobile antenna operation sites).

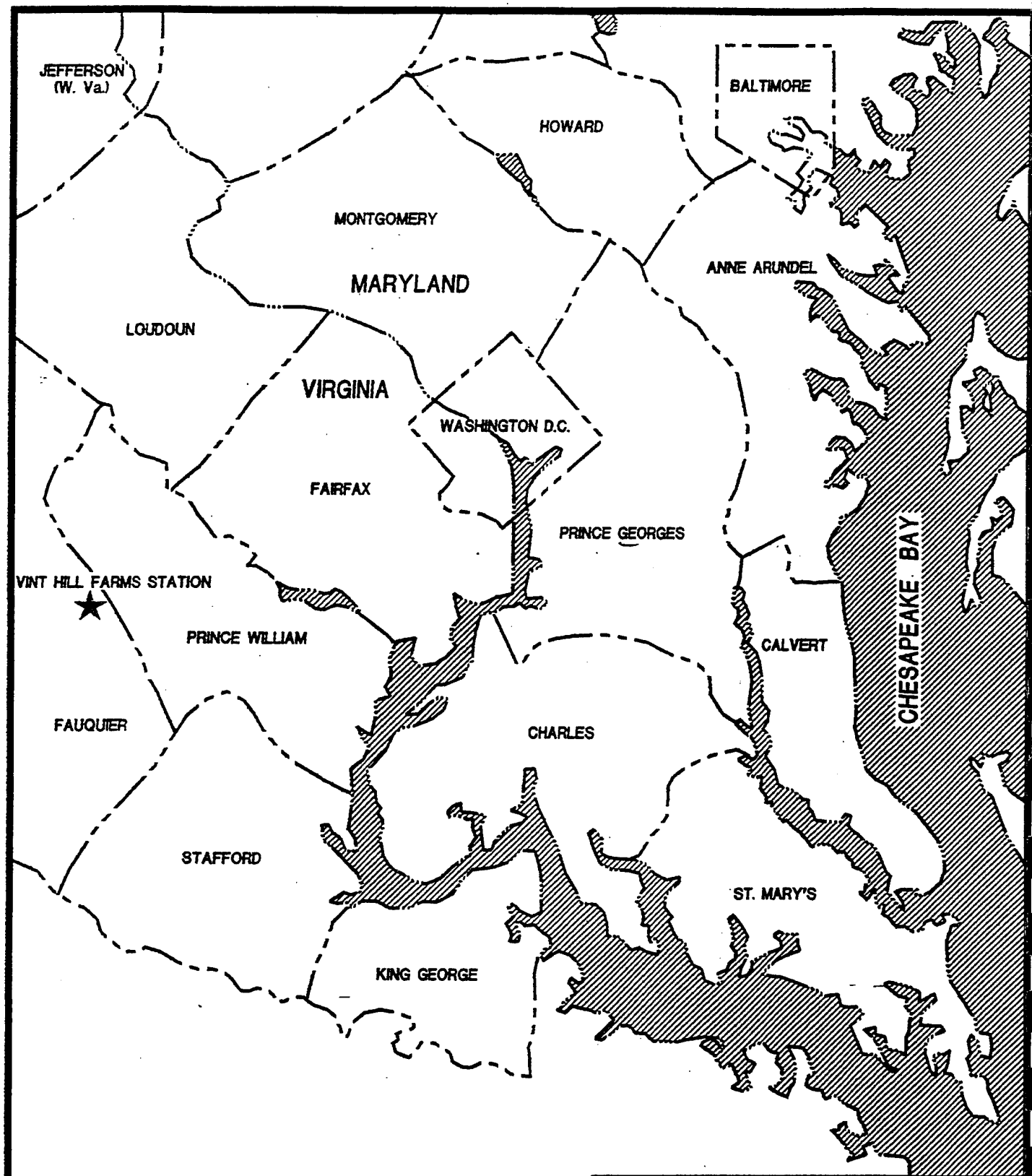
VHFS is part of the Communications-Electronics Command (CECOM), a Major Subordinate Command of the U.S. Army Materiel Command (AMC). The installation is host to a variety of activities and tenants with varying missions. The two main activities involve the Intelligence Materiel Management Center (IMMC) and the Intelligence Electronic Warfare Directorate (IEWD). IMMC provides integrated wholesale and specialized logistics support to the Army, Department of Defense (DOD) customers, and foreign allies for assigned signals intelligence/electronics warfare weapons systems and equipment. IEWD provides effective signals intelligence, communications jamming, and intelligence fusion material capability to the Army. Pertinent information regarding VHFS is provided in Table 2-1.

2.2 DESCRIPTION OF FACILITIES

The specific facilities that are used for generation, storage, and disposal of hazardous materials are described in Section 3 of this document. An overview of some of these facilities is presented below.

2.2.1 Industrial Operations

Three major industrial operations exist at VHFS; two are operated by the Army and one by a government tenant agency (i.e., the U.S. Environmental Protection Agency [EPA]). The first industrial operation is within the Electronic Equipment Facility. The facility is used for



Science Applications International Corporation

Vint Hill Farms Station
Warrenton, Virginia
Enhanced Preliminary Assessment

GENERAL LOCATION OF VHFS

Figure:	Project:	File:	Date:
2-1	01-0827-03-6521-001	93064\DWGS\515LOC1	10\26\93

Table 2-1. Identifying Information for VHFS

Property Address:	Vint Hill Farms Station State Route 652 Warrenton, Virginia 22186-5013
Installation Coordinates:	38°44' N; 77°40' W
County:	Fauquier County, Virginia
Size:	701 acres
Federal Facility ID#:	VA211220931
Property Description:	VHFS is located 30 miles west of Washington, DC. This facility is bounded by Prince William County to the east and South Run to the north.
Command:	U.S. Army Materiel Command
Installation Commander:	Colonel Cornwell
Mission:	To research, develop, produce, and sustain new signals warfare technology for military intelligence.
Operations:	The Installation is host to a variety of activities and tenants with varying missions. The two main activities involve the Intelligence Materiel Management Center (IMMC) and the Intelligence Electronic Warfare Directorate (IEWD).

Sources: Weston 1992 and Reisch 1993

metal etching, photographic development, and sandblasting, and contains a dry filter painting booth. The liquid waste products of these processes are filtered, neutralized, and then discharged to the sanitary sewer.

The second industrial operation is within the Vehicle Maintenance Area. Minor vehicle repairs are performed in this area. The wash racks in the maintenance shops drain to the storm sewer system after passing though oil and sediment traps. The floor drains, sinks, and other drains in the service bays discharge directly to the sanitary sewer.

The third industrial operation is performed by EPA within the Environmental Photographic Interpretation Center (EPIC) Building. This facility develops film and interprets photographs of environmental interest. Both color and black and white film are processed. An ion-exchange system is used to recover silver and regenerate ferric cyanide bleach before discharge to the sanitary sewer.

2.2.2 Hazardous Materials Storage and Disposal

Various satellite storage areas and central storage areas are used to store hazardous wastes before disposal. Resource Conservation and Recovery Act (RCRA) satellite accumulation points for hazardous wastes are found in the Electrical Equipment Facility, Auto Craft Shop, EPIC Building, Vehicle Maintenance Area, and AAFES Service Station. Currently, many of these wastes are transferred to a RCRA 90-day central storage area, the Hazardous Waste Storage Building. Dump #1, the Former Photographic Wastewater Lagoon, and the Sludge Disposal Area previously were used for hazardous waste disposal.

2.3 PROPERTY HISTORY

The earliest recorded ownership of the property now known as VHFS was a deed transferring land from Charter Carter to Thomas and Sarah Foster in 1783. A portion of property was deeded to William Herndon in 1783. In 1803, administrator's of Mr. Herndon's estate sold the property to Thomas Hooe. The property was willed to Bernard Hooe, but subsequently was turned over to Richard and Lucy Bucker as the result of a lawsuit. Ms.

Bucker gave the land to Virginia Brooks in 1853. The farmland, which totaled 729 acres at that time, was sold by Ms. Brooks to Andrew Low in 1860.

Mr. Low began construction of a residence on the site, which still stands, and serves as the Officers Club (Building 247). The construction was halted during the Civil War, but was completed in the late 1860's. In 1910, Mr. Low sold 600 acres to O. Johnston and the remaining acres to Herbert Carneal. Both land parcels were sold to Martin Kohler in the spring of 1911. The farm was purchased by Mitchell Harrison in July 1911. The property ultimately was passed on to Margaret Janet Harrison and John Kearsley Mitchell Harrison, who used it as a dairy farm. The War Department surveyed Vint Hill in May 1942 as possible land for establishing a new military installation. The land, which totaled 721 acres at this time, was purchased by the Government for $127,500 and transfer of the title was passed from the Harrisons on July 7, 1942.

U.S. Army personnel arrived at Vint Hill during June 1942, while the Harrisons and the Government were negotiating the purchase price. The installation was named VHFS at that time. Construction of temporary buildings began, and troops were transferred to VHFS from Fort Monmouth and Hancock, New Jersey. Lt. Robert Pope was assigned as the first Post Commander.

During World War II, VHFS served as a training center for signal corps personnel, and as a refitting station for signal units returning from combat before future overseas deployment. These training activities were transferred from VHFS to Carlisle Barracks, Pennsylvania, in March 1949.

Permanent housing for troops and dependents was built and improved upon during the late 1940's. During and after the Korean conflict, VHFS expanded its facilities in support of military intelligence and communication activities. In addition, significant improvements were made in the areas of living and recreational buildings. The gymnasium, theater, service club, post exchange, and bowling alley were built during the early 1950's.

Since the Korean conflict, various activities and tenants have been present at VHFS. In 1961, the U.S. Army Electronic Materiel Readiness Activity was moved to VHFS. In 1973, EPA took over operation of the photographic interpretation center from the Defense Intelligence Agency. In 1974, the mission of VHFS refocused to a research and development role, with production of new signals warfare technology for military intelligence. The U.S. Army Materiel Command became the major command for VHFS in 1987. VHFS is currently under the Major Subordinate Command of the U.S. Army Communications-Electronic Command.

In 1976, approximately 14 acres along the northwest boundary of VHFS were excessed. Part of this area, which is at the corner of State Routes 215 and 652, serves as a county park. In 1979, approximately 5 acres of VHFS land were sold to the Commonwealth of Virginia, Department of Highways for a right-of-way at the northern boundary. VHFS is currently composed of 701 acres.

In March 1993, the Base Realignment and Closure Commission submitted its recommendation that VHFS be selected for closure. The Base Realignment and Closure Act requires addressing environmental issues at Base closure properties to be investigated pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

2.4 TENANT ACTIVITIES

Numerous tenants have used VHFS for a variety of activities from 1942 to the present. However, few of the tenants have used or produced toxic or hazardous substances. Current significant tenants are described below:

- ***Intelligence Materiel Management Center (IMMC)***—Performs assigned materiel management and maintenance and support functions for Federal Supply Classification (FSC) 5811 and other related items including integrated materiel inventory management, integrated logistics support, configuration management, storage, distribution, disposal, maintenance, fabrication, and international logistics programs related to the wholesale supply and maintenance system. IMMC also provides common items supply support to specific INSCOM units/activities and former USASA units/activities on an emergency basis and performs engineering and provides technical assistance for managed materiel in support of Electronic Warfare/Signal Intelligence units.

- *EPA Environmental Photographic Interpretation Center (EPIC)*—Since July 1973, EPA has operated EPIC to conduct photographic laboratory processing procedures in support of the overall mission of EPA. EPIC activities range from pollution source inventories to land-use studies and searches for abandoned and forgotten hazardous waste disposal sites throughout the use of historical imagery. EPIC conducts large-area aerial surveillance to monitor compliance with environmental laws, determine environmental trends, and flag locations for ground inspection. In addition, EPIC supports Regional Emergency Response Teams on spills of oil and hazardous materials that occur east of the Mississippi River. These activities are conducted within the EPIC Building.
- *U.S. Army Health Clinic (USAHC)*—As an element of DeWitt Army Hospital, Fort Belvoir, USAHC provides medical support to all active duty military personnel assigned to VHFS and those assigned to outlying organizations in this area; all dependents of active duty military assigned to this station, including retired military and their dependents, and transients and their dependents; and all civilians employed at VHFS in emergency situations, based on availability of physicians and clinic personnel. These activities are conducted within the Health Clinic.
- *U.S. Army Dental Clinic (USADC)*—Provides dental services, including x ray activities, to eligible military and civilian personnel of VHFS, and functions as an element of DeWitt Army Hospital, Fort Belvoir. These activities are conducted within the Health Clinic.

Other major tenants include the Intelligence and Electronics Warfare Directorate (IEWD), Program Executive Officer Intelligence and Electronic Warfare (PEO-IEW), U.S. Army Information Systems Command (ISC), Test Measurement and Diagnostic Equipment (TMDE) support operations, and 201st Military Intelligence Battalion. A variety of miscellaneous minor tenants also occupy space at VHFS, including AAFES Service Station, AAFES Post Exchange, AAFES Laundry, AAFES Bowling Alley, First Virginia Bank, Counter Drug, commissary, credit union, thrift shop, U.S. Post Office, legal office, day care center, barber shop, guest house, and library. The former tenants at VHFS are listed in Table 2-2.

2.5 PERMITTING STATUS

2.5.1 RCRA Status

VHFS is a RCRA large quantity generator (LQG) because more than 1,000 kg of hazardous wastes are generated each month. These hazardous wastes are disposed of using EPA identification number VA211220931. Various satellite storage areas and central storage areas are used to store hazardous wastes before disposal. Satellite storage areas for hazardous wastes

Table 2-2. Former Tenants at VHFS

USASA Processing Center
U.S. Army Signal Research Unit #7
U.S. Army Signal Research Unit #1
370th ASA Co. (Rear)
USASA Supply and Maintenance Center
USASA Special Project Unit
Communication Security Detachment 8600 AAU
First USASA Operation Company
USAACDAA
80th USASA Special Operation
National Security Agency
Command Data System Activity
109th Military Intelligence Group
USAICA
ISSD
Defense Intelligence Agency
USASA National Inventory
37th Signal Service Detachment
NSA Experimental Facility
902nd Military Intelligence Group SIGSEC Element
Company B, 303rd Military Battalion, EW
Harry Diamond Laboratories Field Contracting Activity
Customs Inspector

Source: ESE 1981

are contained in the Electrical Equipment Facility, Auto Craft Shop, EPIC Building, Vehicle Maintenance Area, and AAFES Service Station. Currently, many of these wastes are transferred to a central storage area, the Hazardous Waste Storage Building. However, the Vehicle Maintenance Area and the EPIC Building have their own centralized hazardous materials storage areas.

The Hazardous Waste Storage Building has been used since 1990 for 90-day storage of hazardous wastes. The facility often has been cited for exceedances of the 90-day limit. Only RCRA-permitted storage facilities may store wastes greater than 90 days. Hazardous wastes with no salvage value are removed by the Defense Reutilization Management Office (DRMO) and taken to an approved hazardous waste landfill (USAEHA 1983).

Dump #1, the Former Photographic Wastewater Lagoon, and the Sludge Disposal Area previously were used for land disposal of hazardous wastes and materials. These facilities did not have RCRA permits during their operational periods and were not subject to RCRA closure requirements.

Most other hazardous materials, including paints, solvents, and pesticides, are transported on and off the installation by contractors. However, before February 1981, insecticides, herbicides (including DDT), fungicides, and rodenticides were stored and mixed on Post (ESE 1981). The wastes were then disposed of in the storm sewer.

2.5.2 CERCLA Status

In 1988, EPA Region III required that all facilities on the Federal Docket (including VHFS) submit a preliminary assessment (PA) in order to assign a hazard ranking (HR) to these facilities. VHFS submitted a PA to EPA Region III in 1990 to satisfy this requirement. EPA then updated its guidance by finalizing the revised version of the Hazard Ranking System (HRS) in 1991. This revision required more detailed information to determine if VHFS is eligible for placement on the National Priorities List (NPL). VHFS submitted a PA Addendum in 1992 to address the additional PA deficiencies. Currently, an HR has not been assigned to the facility because the EPA has not completed its evaluation of the facility (Morekas 1993).

2.5.3 NPDES/VPDES Permits

The Sewage Treatment Plant has received numerous Notices of Violation (NOVs) from the Virginia State Water Control Board (SWCB) regarding its discharge to South Run. The Virginia SWCB regulates the discharge through Virginia Pollutant Discharge Elimination System (VPDES) permit VA0020460. The most recent NOVs were for exceedances of their VPDES permitted concentrations of total suspended solids (TSS), biological oxygen demand (BOD), and phosphorus in their discharge. These were attributable to problems with the aerobic digester. These problems have been corrected and the facility has not received an NOV of their VPDES permit in more than a year (Reisch 1993).

In April 1990, VHFS entered into an agreement with the Virginia SWCB through a Consent Special Order to complete upgrades to the existing sewage treatment plant facilities and associated distribution system. The required upgrades included: 1) replacement of the sewage lift station pumps (completed July 1990), 2) clean-out of the sludge digester and flocculator (completed June 1991), and 3) conducting an Inflow and Infiltration (I/I) study of the sewage distribution system (completed May 1991). The installation continues to program and fund projects to correct existing deficiencies in wastewater treatment and has made a considerable effort to decrease possible future VPDES violations. For example, the ultraviolet (UV) disinfection system replaced the chlorine contact tanks in 1992 and eliminated the need to dechlorinate the discharge in order to meet zero chlorine limits.

The plant has just renewed their VPDES permit with the Virginia SWCB. The permit stipulates that the plant must not exceed the design flow of the plant (0.246 mgd). Due to infiltration of rainwater to the sewage system, storm events in the past have flooded the plant and caused sewage spills. The installation is considering options (e.g., an equalization basin) for expanding and upgrading the existing treatment plant to increase the design flow capacity.

In April 1982, the Virginia SWCB informed VHFS that the discharge of the motor pool, IMMC, and EPIC to the tributary of South Run was an "unpermitted and unauthorized discharge to state surface waters" (Brown 1982). Therefore, the installation applied for an industrial discharge permit for its discharge to the South Run tributary. According to the permit

application, the tributary received discharges from Outfall 101 (the Military Motor Pool wash racks) (450 GPD), Outfall 201 (the Civilian Motor Pool wash rack) (450 GPD), Outfall 301 (the swimming pool backwash) (650 GPD), Outfall 401 (IMMC) (250 GPD), and Outfall 501 (EPIC photographic laboratory) (6,000 GPD). However, after the EPIC and IMMC discharges were connected to the sanitary sewer in June 1983, the application was withdrawn.

During its operational period, the Former Sewage Treatment Plant held NPDES permit VA0002569 from EPA Region III for its discharge to the western South Run tributary. (The Virginia SWCB did not receive authority to issue its own permits until 1983, and these permits were called VPDES permits after 1988.) The permit was canceled in 1981 with the closure of the plant.

Stormwater drainage is accomplished by a combined system of natural drainage ditches, open swales, and drainage pipes. The property is in the process of obtaining a stormwater permit and its runoff is being sampled by a private contractor.

2.5.4 Solid Waste Permits

Currently, the solid wastes and dried sewage sludge from VHFS are taken to the Fauquier County Landfill. A portion of the waste stream is recycled through composting of yard wastes (e.g., branches, tree stumps, grass, and leaves) in Dump #3 and drop-off containers for aluminum cans and glass. In the future, the facility also plans to recycle cardboard and office paper to meet Virginia Solid Waste regulations to reduce the solid waste stream by at least 25 percent by 1995. VHFS is a member of the Virginia District 9 Solid Waste Management Plan.

From 1944 to 1973, all solid wastes were burned and buried in Dump #1. After 1973, the facility used the Incinerator to reduce the burnable solid waste to ash. The ash and nonburnables were then disposed of in the Fauquier County Landfill. Since the Incinerator shut down in 1987, all wastes, including construction debris, sewage sludge, nonfriable asbestos wastes, and ash from the classified documents incinerators, have been transported to the Fauquier County Landfill.

Various sites have been used throughout the property for disposal of construction debris. From 1983 to 1985, construction debris was disposed of in Dump #2 through the authority of Virginia Solid Waste Management Permit Number 423. No other permitted construction debris landfills are known, although areas with concrete debris, pipe sections, and metal cable were found during the visual inspection. No further investigation is warranted at these areas due to the inert nature of the wastes.

Some solid wastes are removed by nonfacility personnel. Food wastes from the mess hall are picked up by local farmers for hog feed and compost (USAEHA 1983). Medical wastes from the Health Clinic are removed by Health Clinic personnel and taken to the medical waste incinerator at Fort Belvoir (USAEHA 1983).

2.5.5 Air Permits

VHFS is located in the National Capital Interstate Air Quality Control Region (AQCR). The National Capital Interstate AQCR is an attainment area for sulfur dioxide, particulates, carbon monoxide, nitrogen dioxide, ozone, and lead.

VHFS currently does not have any air permits for its air emissions sources (e.g., gasoline underground storage tanks [USTs], sewage treatment plant [STP] laboratory hoods, classified documents incinerators, and individual boilers). However, the gasoline USTs at the AAFES Service Station and Vehicle Maintenance Area are registered with the Virginia Air Pollution Control Board (APCB) under Registration Number 40246. Classified documents incinerators and heating units less than 3.5 mBtu need not be registered (Clayton 1993). The facility may have to apply for a group air permit by 1995 (Reisch 1993).

Previously, the Virginia APCB had required that the Incinerator (SCC #50200101) and steam boilers in Building 161 (SCC #10300501) be registered and submit annual estimates of emission rates. The emission control program consisted of routine maintenance to ensure operation of equipment at design efficiency. After the Incinerator was shut down and the steam boilers taken off line, the gasoline USTs were the only reason to continue inspections at the facility.

Classified wastes, including paper documents and small amounts of plastic typewriter ribbon, are generated at approximately 20 tons per month. Two single-chambered incinerators are located adjacent to Building 260 (IEWD), but only one is operated frequently. This incinerator burns most of the on Post-generated classified wastes on a daily basis. An old incinerator was located near Building 229 (Procurement), but it was removed and scrapped in 1983. The ash from the active incinerators is stored in dumpsters and then transported to the Fauquier County Landfill.

The facility is complying with AMC regulation 70-67 to gradually eliminate the use of ozone-depleting substances. The facility used the chlorofluorocarbons CFC-12, CFC-502, and HCFC-22 during 1991. The amount released to the atmosphere was estimated to be 660, 550, and 2,160 pounds, respectively. The CFCs are used in the air conditioners, refrigerators, and in the cooling tower at Building 260 (IEWD). The facility plans to use fewer CFCs in future years.

2.5.6 UST Permits

Information on the active USTs at VHFS is provided in Table 2-3. All of these tanks are registered with the Virginia SWCB with the exception of the AAFES Service Station waste oil tank, STP Emergency Generator tank, and the Lift Station Emergency Generator tank. According to the VA SWCB, these tanks do not need to be registered due to their size and function (Hilder 1993). The SWCB data base of the tanks registered at VHFS contains outdated and incorrect information (e.g., incorrect tank sizes, building numbers, products, and installation dates).

In February 1993, all of the active USTs and their distribution lines passed a vacuum pressure leak test. However, the only tank in conformance to Federal standards for leak detection, corrosion protection, and overfill protection is the 10,000-gallon fiberglass gasoline tank in the Vehicle Maintenance Area, which was replaced in 1990. The remainder of the tanks will have to receive monthly monitoring and annual tank tightness tests to conform to the leak detection regulations. All USTs will have to be upgraded or replaced by December 1998 to conform to corrosion protection and overfill protection guidelines.

Table 2-3. Active Underground Storage Tanks at VHFS

Location	Capacity (gallons)	Construction	Contents	Installation Date
Bldg 287: Vehicle Maintenance Area	2,000	Steel	Diesel	1982
	2,000	Steel	Diesel	1982
	10,000	Fiberglass	Unleaded Gasoline	1990
Bldg 238: AAFES Service Station	10,000	Steel	Unleaded Gasoline*	1969
	10,000	Steel	Unleaded Gasoline*	1969
	10,000	Steel	Unleaded Gasoline*	1969
	550	Steel	Waste Oil	1969
Bldg 248: Engineering Compound Fuel Point	1,000	Steel	Unleaded Gasoline	Unknown (1944?)
	1,000	Steel	Unleaded Gasoline	Unknown (1944?)
Bldg 261: IEWD Emergency Generators	15,000	Steel	Diesel	1967
	8,000	Steel	Diesel	1951
	2,000	Steel	Diesel	1985
Bldg 260: IEWD Emergency Generator	5,000	Steel	Diesel	1944
Bldg 227: Power Plant Emergency Generator	2,000	Steel	Diesel	1985
Bldg 398: STP Emergency Generator	550	Steel	Diesel	1978
Bldg 205: Lift Station Emergency Generator	550	Steel	Diesel	1978

* may have contained leaded gasoline previously

Sources: USACE 1993, ESE 1981, and Reisch 1993

Information on all known removed, replaced, and abandoned USTs is provided in Table 2-4. The condition of these tanks at the time of their removal, replacement, or abandonment is unknown. However, due to the construction (i.e., steel) and ages (i.e., most are over 20 years old) of the tanks, they could have leaked.

Some old septic tanks are located in the northern areas of the facility (e.g., the Incinerator and Sugar Tree) and near the family housing units (FHUs). Most were abandoned when sewer lines were installed. The facility is adding a new sewage lift station in the northern area to service Sugar Tree. The sewage flows by gravity to the lift station and is then carried through a forced main to the Sewage Treatment Plant. The Incinerator has the only remaining "active" septic tank which is currently out of service as previously stated.

2.5.7 Water Supply Permits

Five water supply wells exist on the VHFS property. Currently, VHFS has three water wells in use, which supply the drinking water for the 400 residents and the 2,000 daily employees. The well depths range from 360 to 600 feet. The fourth well has been shut down and will be restarted after a filter system is installed to remove manganese while the fifth well tested positive for bacterial contamination and is not in use. Total capacity of the five wells is approximately 1,000,000 gallons/day. The groundwater is treated at the pump houses by chlorination, fluoridation, and with sodium hexametaphosphate (for corrosion control before distribution).

The Virginia Department of Health (VDH) instituted a Drinking Water Monitoring Program (DWMP) in May 1989 in accordance with Virginia laws for a facility serving this size population. The program requires that inorganic, radiological, volatile, and microbial contaminants be analyzed for every 3 years on a staggered basis. Since this time, none of the primary contaminants have been detected in the groundwater at levels above regulatory criteria. However, high concentrations of manganese, sulfate, and carbonate have been detected and cause aesthetic rather than health-related problems.

Table 2-4. Removed, Replaced, and Abandoned USTs at VHFS

Location	Capacity (gallons)	Construction	Contents	Installation Date	Status
Bldg 161: Former Steam Plant	30,000	Steel	Fuel Oil	Unknown (1978?)	Removed in 1990
	30,000	Steel	Fuel Oil	Unknown (1978?)	Removed in 1990
Bldg 306: Auto Craft Shop	1,000	Steel	Waste Oil*	Unknown	Removed in 1992
Bldg 220: Former Service Station	Unknown	Steel	Gasoline	Unknown	Abandoned in 1983
	Unknown	Steel	Gasoline	Unknown	Abandoned in 1983
Bldg 287: Vehicle Maintenance Area	12,000	Steel	Gasoline	1982	Replaced in 1990
Bldg 261: IEWD Emergency Generator	2,000	Steel	Diesel	1951	Replaced in 1985
Bldg 227: Emergency Generator	1,000	Steel	Diesel	1944	Replaced in 1985

* contained diesel fuel previously.

Sources: USACE 1993 and ESE 1981

Previous samplings of the drinking water have not detected significant contamination. Sampling of Well 1 on September 18, 1974 detected gross alpha at 18.5 pCi/L, which is above the safe drinking water standard of 15 pCi/L. However, alpha contamination was not detected during later sampling. An October 1983 sampling by VDH did not detect any primary contaminants above the drinking water action levels, and a June 1985 sampling showed no bacteriological contaminants.

The facility also conducted a sampling of the drinking water at all of the office water fountains in June 1990 and the residential tap water in March and June 1993. The surveys were conducted in accordance with recently revised drinking water regulations to determine if lead or copper were present in the drinking water above action levels. The few drinking water tanks that were above the lead action level (0.02 mg/L) were replaced (e.g., the lead concentration in a water fountain in Building 303 was found to be 0.103 mg/L and was subsequently replaced). However, the concentrations of lead and copper in the 90th percentile were below the action levels in each testing cycle and the VDH has authorized VHFS to go to reduced monitoring (i.e., once per year from June to September).

2.6 SURROUNDING ENVIRONMENT AND LAND USES

The following sections provide information regarding the demographics, land use, climate, meteorology, hydrology, physiography, geology, hydrogeology, and sensitive environments in the vicinity of VHFS.

2.6.1 Demographics and Land Use

Approximately 7,000 people live within 4 miles of VHFS (Weston 1990). In addition, there are 244 FHUs and a number of barracks for enlisted personnel at VHFS. The residential population is 400. Land use in the immediate vicinity of VHFS consists mainly of agriculture (mostly horse farms) and residential areas. With the exception of a few residences to the north, the majority of residential development is located south of VHFS. A small county recreation park is located adjacent to VHFS along South Run. Other land uses that are more commercial and industrial are located closer to the population centers of Warrenton to the southwest and Manassas to the east. According to U.S. Bureau of the Census data, the population in these

centers and in Fauquier County have been increasing as shown in Table 2-5. Public access areas at Lake Brittle and Lake Manassas are within 1 mile of VHFS (ESE 1986).

Table 2-5. Fauquier County Census Data

Census Designated Area	1980 Census	1990 Census
Warrenton	3,907	4,830
Manassas	15,438	27,957
Manassas Park	6,524	6,734
Fauquier County	35,889	48,741

Sources: Rand McNally 1986 and 1992.

2.6.2 Climate and Meteorology

The climatic conditions at VHFS are variable, with influences from the Atlantic Ocean to the east and the Appalachian Mountains to the west. Summers are characterized by maritime-tropical winds from the south and southwest, which bring warm, humid air to the region. High-pressure systems often stagnate over the area, creating air pollution episodes several times during the summer. Winter is characterized by cold, dry, continental polar winds from the northwest.

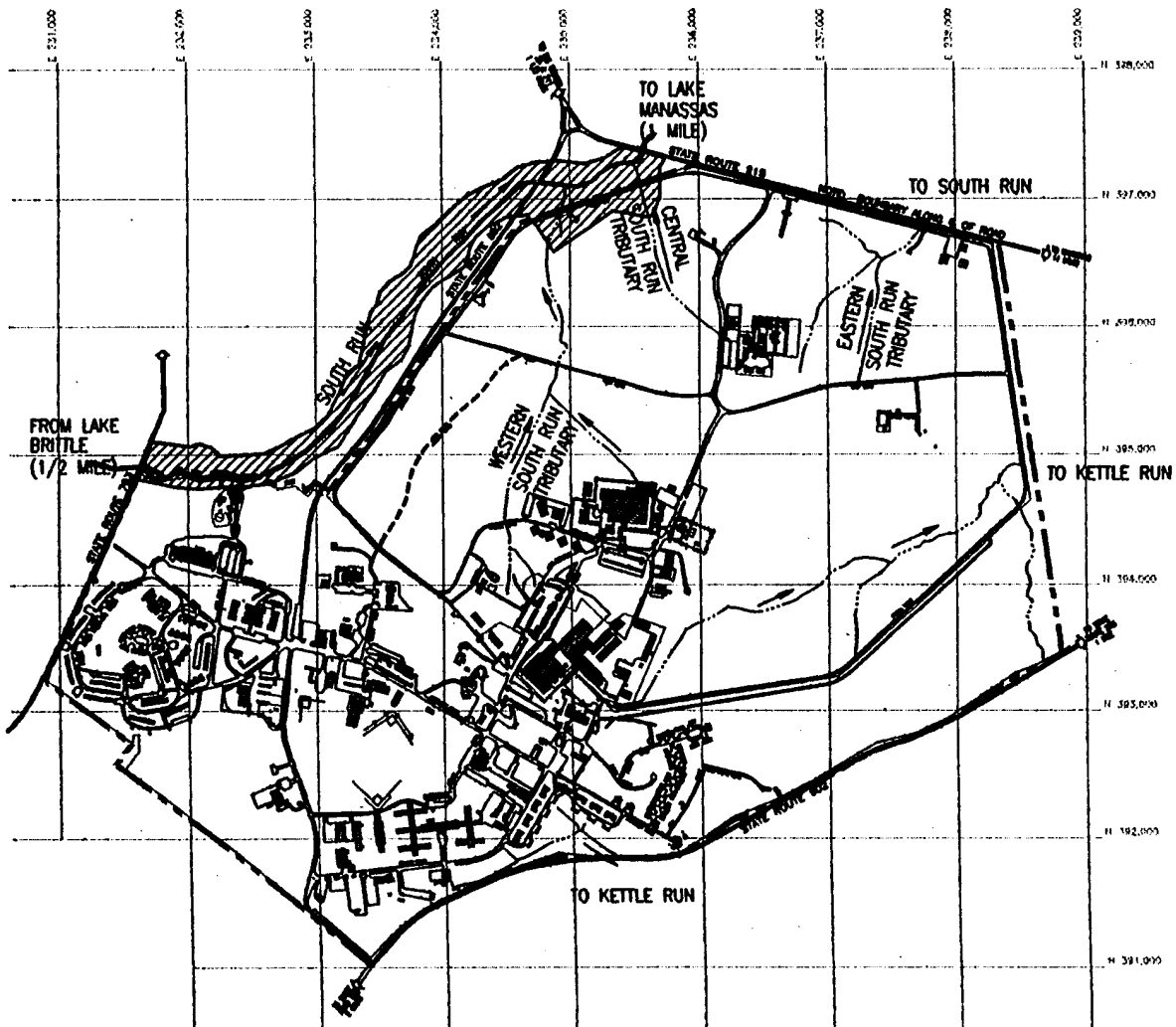
Average temperature at VHFS varies from a monthly low of 1.5°C in January to a mean monthly high of 24.3°C in August. The average annual rainfall is 104.8 cm, while snowfall averages 61 cm annually.

2.6.3 Hydrology and Physiography

The following sections discuss the hydrology, physiography, and soils in the vicinity of VHFS.

2.6.3.1 Hydrology

VHFS is located in the Occoquan watershed. Most of the facility drains to South Run via intermittent tributaries and drainage ditches as shown in Figure 2-2. South Run is a small



LEGEND:

- BUILDING
- SITE DRAINAGE OR STREAM
- PAVED ROAD
- FENCE
- INSTALLATION BOUNDARY
- FLOW ARROW
- 100-YEAR FLOODPLAIN

N

0 500 1,000 1,500 3,000

SCALE: 1" = 1,500'

Science Applications International Corporation

VINT HILL FARMS STATION
WARRENTON, VIRGINIA
ENHANCED PRELIMINARY ASSESSMENT

SURFACE DRAINAGE AND FLOODPLAIN MAP

Figure:	Project:	File Name:	Date:
2-2	01-0827-03-6521-001	/94019/DWGS/672F2-2	04-25-94

Class III Virginia stream that begins in Fauquier County and flows northeast into Prince William County where it discharges into Lake Manassas, a recreation and drinking water reservoir built on Broad Run for the city of Manassas. Lake Manassas discharges to Broad Run.

South Run's upper reaches were inundated by the construction of the Lake Brittle reservoir, whose dam lies approximately ½ mile west of VHFS. The dam controls the flow into South Run, which can be quite low, as seen during a site visit conducted in September 1993. The installation has a permit (Virginia Pollutant Discharge Elimination System [VPDES] permit VA0020460) to discharge effluent from the Sewage Treatment Plant (STP) into South Run. The STP adds approximately 220,000 gallons per day (GPD) to the natural stream flow of 4,900,000 GPD.

Drainage for the southern part of the installation flows south and east to Kettle Run as shown in Figure 2-2. Kettle Run eventually joins Broad Run approximately 10 miles downstream from Lake Manassas.

2.6.3.2 Physiography

VHFS is located near the border between the Coastal Plain and Piedmont Physiographic Provinces in Virginia. Locally, the topography suggests that VHFS is at the edge of the Piedmont, in the Culpepper Basin of Triassic Age (195 to 230 million years ago). The basin is characterized by rolling terrain with moderate to thin residual soil cover above structurally complex rock strata consisting of folded layers of sedimentary and metamorphic rocks containing zones of igneous intrusion (ESE 1986). Appendix B contains a geologic map of the physiography of VHFS.

Localized topography at VHFS is composed of gently rolling hills with slopes generally less than 10 percent. Elevations on the installation vary from 335 to 430 feet above mean sea level (MSL).

2.6.3.3 Soils

The two major soil associations in the VHFS vicinity are the Montalto and Penn-Croton-Bucks associations, as determined by the 1956 U.S. Department of Agriculture (USDA) Soil Survey of Fauquier County, Virginia. The soil management groups at VHFS are shown in Appendix B. The Montalto soil association has developed predominantly on undulating land from fine-grained Triassic diabase. The moderately shallow phase of Montalto soils is the predominant soil series in the VHFS vicinity. However, smaller areas of Elbert, Zion, Iredell, and recent colluvial and alluvial soils occur (USDA 1956). The Montalto unit is best suited for agricultural and woodland uses. High coarse fragment content and depth to rock are typical limiting factors of this unit. The characteristics of the Montalto association are described in greater detail below:

- ***Elbert Series***—The soils of the Elbert series are very deep and poorly drained gray clayey soils. They formed on flat depressed upland and along small drainage ways and developed in residuum from fine-grained Triassic diabase. The soils are considered to be hydric with high water tables. Slopes range from 0 to 2 percent.
- ***Iredell Series***—The soils of the Iredell series are very deep and poorly to moderately well drained yellowish brown to olive brown claypan soils with perched seasonal water table on convex ridges. They were developed in residuum from Triassic diabase. They may have hydric soil inclusions. Slopes range from 0 to 7 percent.
- ***Zion Series***—The soils of the Zion series are moderately deep and somewhat poorly drained yellowish-brown clayey soils. They formed on gently sloping concave uplands and developed in residuum from coarse-grained Triassic diabase. They may have hydric soil inclusions. Slopes range from 2 to 7 percent.

The Penn-Croton-Bucks unit is the most common in Fauquier County (over 19 percent of the county) and contains the greatest number of soils. It occurs in the Culpepper basin and is underlain by shale and sandstone. The Penn soils are the predominant soils in the association. The Croton, Kelly, Wadesboro, Calverton, and Bucks soils are less extensive and make up an important part of the association. Minor areas of Catlett soils occur in the uplands, terrace, and first bottom soils along the streams. The soils of the association are evenly distributed throughout the county, with the exception of the Wadesboro, which is mostly found near Greenville. The Penn-Croton-Bucks unit is well-suited for most agricultural uses. The major use limitations with this soil association are depth to bedrock, droughtiness, and seasonal water

tables. The characteristics of Penn-Croton-Bucks association soils are described in greater detail below:

- ***Penn Series***—The soils of the Penn series are shallow to moderately deep and well to excessively well drained, reddish-brown loamy to silty soils. They developed in residuum from Triassic siltstone, shale, and fine-grained sandstone. Slopes range from 0 to 25 percent.
- ***Croton Series***—The soils of the Croton series are deep and poorly drained, mottled yellowish-brown and gray clayey soils with seasonal perched water tables in concave landscapes (swales) and drainageways. They developed in local alluvium washed from Triassic uplands. They are considered to be hydric. Slopes range from 0 to 5 percent.
- ***Kelly Series***—The soils of the Kelly series are deep and moderately well to poorly drained, gray and grayish-brown claypan soils with seasonal perched water tables on gently sloping concave uplands. They developed in local wash and residuum from thermally altered Triassic shale. They may have hydric soil inclusions. Slopes range from 0 to 7 percent.
- ***Wadesboro Series***—The soils of the Wadesboro series are deep and well drained, red to dark-red loamy soils on sideslopes. They developed in residuum from Triassic siltstone, shale, sandstone, and conglomerate. Slopes range from 7 to 14 percent.
- ***Calverton Series***—The soils of the Calverton series are moderately deep and somewhat poorly drained, yellowish-brown mottled with gray clayey soils with seasonal perched water tables. They developed in local colluvium and residuum from red Triassic shale and sandstone. They may have hydric soil inclusions. Slopes range from 2 to 7 percent.
- ***Bucks Series***—The soils of the Bucks series are deep and well drained dark reddish-brown silty soils. They formed on broad gently sloping ridges and developed in residuum from red Triassic shale and sandstone. Slopes range from 2 to 7 percent.
- ***Catlett Series***—The soils of the Catlett series are shallow and moderately well drained, grayish brown silty soils containing more than 35 percent rock fragments. They formed on gently sloping sideslopes and developed in residuum from bluish-gray thermally altered Triassic shale. Slopes range from 2 to 7 percent.

2.6.4 Geology and Hydrogeology

The following sections provide a brief overview of the regional geology and hydrogeology in the vicinity of VHFS.

2.6.4.1 Geology

VHFS is situated in the Culpepper basin (Lee 1979), which was formed during the Jurassic and/or Triassic period. This basin is located near the border of the Coastal Plain and Piedmont physiographic provinces and is one of a series of tensionally faulted, graben-like trenches that extend from Nova Scotia to Georgia along the Appalachian mountain system. The series of trench systems or Triassic Basins was formed by downfaulting as a result of fracturing associated with the Triassic-Jurassic continental split of North America.

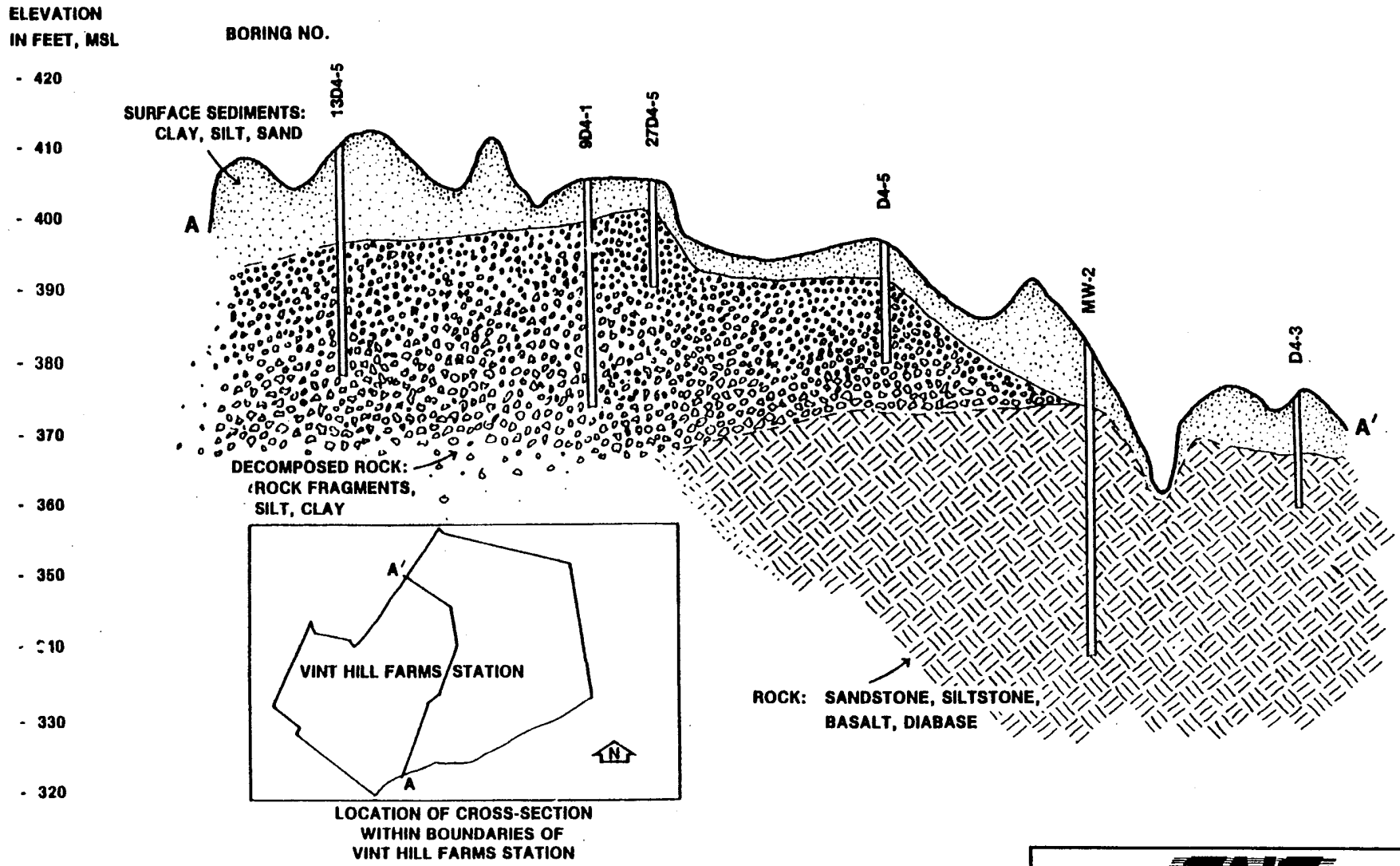
Geologic material underlying VHFS consists of shale, siltstone, basalt, and diabase. Metamorphosed hornfels, granite, and quartzite also can be found. Basalts comprise the predominant near-surface rock in the western portion of the installation, whereas the sedimentary red beds are common on the eastern side. Regional faulting has resulted in three mafic intrusions at VHFS. A geologic cross-section of VHFS is shown in Figure 2-3.

Residual soils have developed from the weathering of underlying bedrock. Bedrock is encountered at depths ranging from a few feet below land surface (BLS) on the northern side of the installation to 39 feet BLS on the southern side of the installation (ESE 1986). The thickness of the unconsolidated residual material on VHFS is shown in Figure 2-4.

2.6.4.2 Hydrogeology

Current data suggest that the groundwater system in the area of VHFS is a single aquifer system. As defined by the EPA, VHFS is not located over a sole-source aquifer; however, this system is used as the drinking water source for 400 VHFS residents and the working population of 2,000 personnel (Weston 1990). Currently, three production wells on VHFS provide potable water for the 400 VHFS residents. Two hundred and fifty private wells within a 4-mile radius provide a water source for 2,000 residents. In addition, there also are 7 public wells within a 4-mile radius of VHFS that provide a water source for 700 residents.

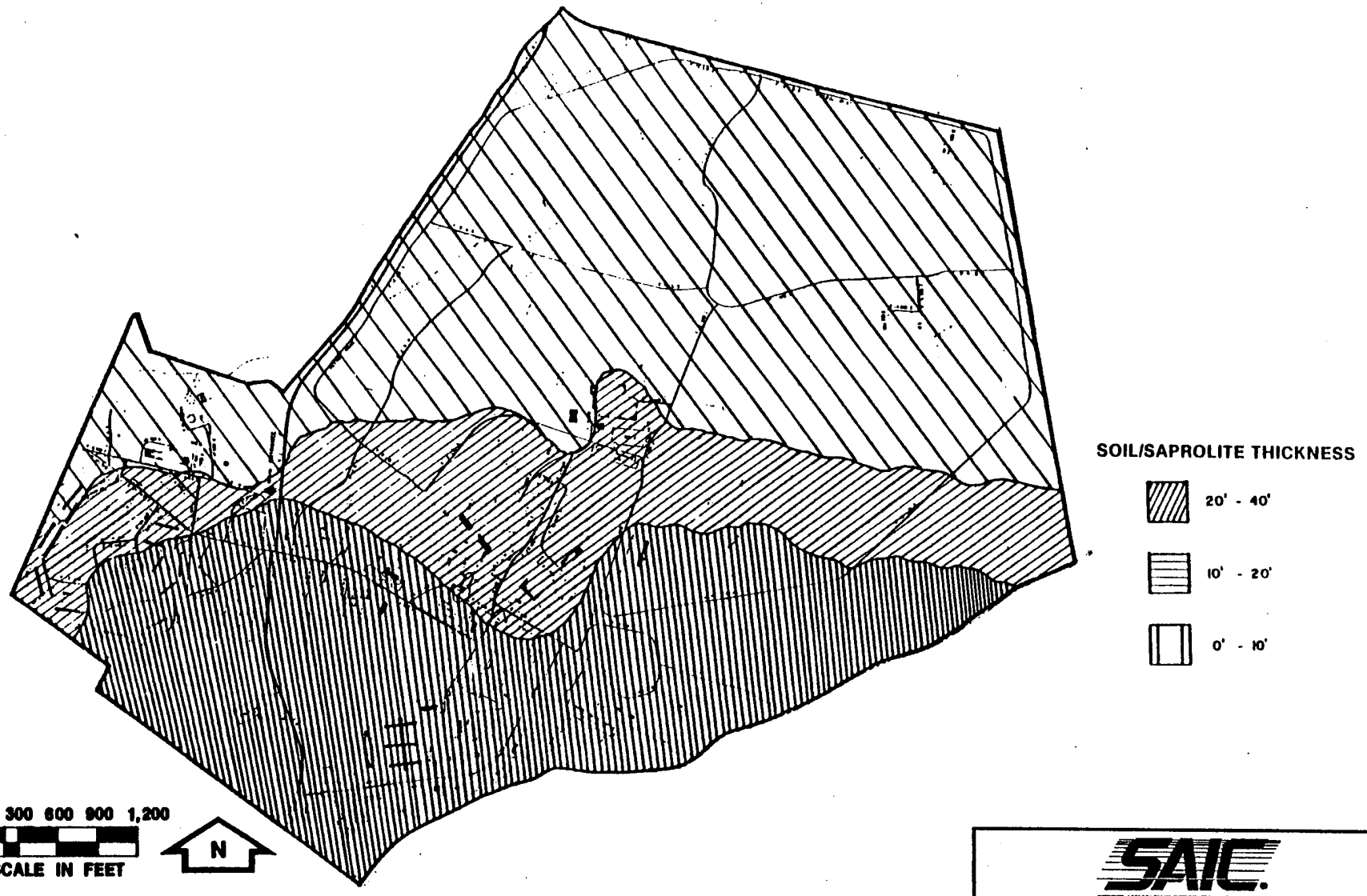
The shallow portion of the aquifer is considered to range from land surface in the low marshy areas along the intermittent streams to 56 feet BLS. This part of the aquifer is characterized by residual/alluvial soil underlain by a zone of decomposed bedrock. Permeability



Geologic Cross Section of VHFS

Vint Hill Farms Station, Warrenton, Virginia

Figure: 2-3 | Project: 01-0827-03-6521-010



SOURCE: U.S. Army Corps of Engineers, Baltimore District, n.d.

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Thickness of Unconsolidated Residual Material on VHFS

Vint Hill Farms Station, Warrenton, Virginia

Figure: 2-4 | Project: 01-0827-03-6521-010

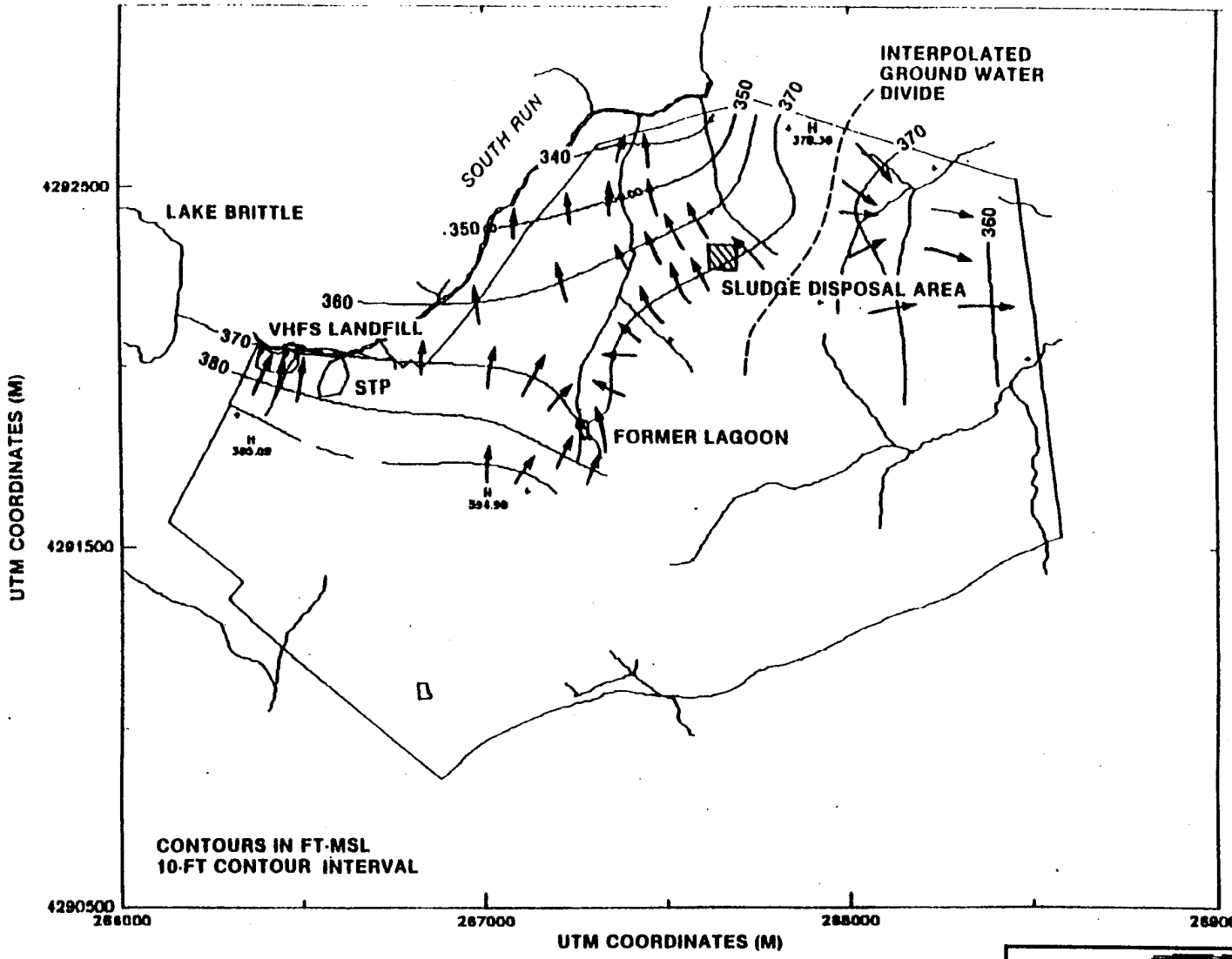
in this part of the aquifer is a function of the degree of weathering and the nature of the original rock. The basalt and diabase rocks tend to weather into clays of low permeability. The short-term effects of weathering appear to result in rock fragments, which would be considered to have a higher permeability. The hydraulic conductivity for the shallow portion of the aquifer is approximately 8×10^{-4} cm/s.

Water levels in the deeper portion of the aquifer beneath VHFS range from 36 to 180 feet BLS. This part of the aquifer is in a fractured bedrock zone that has not been weathered as extensively as the shallow part of the aquifer. Rocks underlying the unconsolidated and heavily weathered and decomposed bedrock are sandstones, siltstones, basalts, and diabase. Although the primary (intergranular) permeability of these rocks is very low, extensive fracturing has caused a relatively high secondary permeability. However, these zones are relatively narrow. The shallow aquifer portion and the deeper aquifer portion are connected hydraulically through vertical faults or fractures. The regional groundwater flow is generally in a northerly direction. The groundwater contours and flow direction for the northern portion of VHFS are shown in Figure 2-5.

The bedrock beneath VHFS exhibits little primary permeability; secondary features such as faulting, fracturing, and weathering are the primary factors in the development of permeability, and thus of groundwater movement. In an extreme situation, all of the groundwater flow may be controlled by a few major fractures, resulting in erratic and often highly complicated flow patterns. Generalization of overall patterns based on a few widely spaced monitoring points may be misleading in such cases. However, in less extreme cases, secondary, tertiary, and lesser systems of smaller fractures interconnect with the major fractures, creating a system in which more or less uniform flow may occur.

2.6.5 Sensitive Environments

No plant or wildlife species listed by the U.S. Fish and Wildlife Service (USFWS) or the Commonwealth of Virginia Endangered Species Act as threatened or endangered are known to occur at VHFS. The southern bald eagle (*Haliaeetis leucocephalus*), an endangered species, is occasionally observed at nearby Lake Manassas. Approximately 5 acres of VHFS property are



Source: VHFS Confirmatory Sampling Program for 5/29/85 (ESE 1986)

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Ground Water Contours and Flow Direction

Vint Hill Farms Station, Warrenton, Virginia

Figure: 2-5 | Project: 01-0827-03-6521-010

within the 100-year floodplain of South Run as shown in Figure 2-2. Dump #1 and the Pistol Range are within the floodplain. The western South Run tributary is considered a palustrine wetland and is the only wetland on the VHFS property (USFWS 1977). Approximately 20 acres of wetlands are within a 4-mile radius of the property.

2.7 NON-CERCLA HAZARDS

2.7.1 Radon

An extensive radon survey was performed in June 1990 using alpha track monitors (ATMs) on all of the office buildings and a sampling of the FHUs. Most of the office buildings and FHUs were below the 4 pCi/L level (national average). No action is necessary for these buildings according to the EPA Guidelines for Corrective Action. However, four buildings were in the 4 to 20 pCi/L (above average) range: the Electronic Equipment Facility (Building 268) at 19.4 pCi/L, the Officers Club (Building 247) at 9.4 pCi/L, the STP laboratory (Building 398) at 4.9 pCi/L, and Building 230 at 5.3 pCi/L. Resampling in March 1993 confirmed these results. Although not required by the EPA, VHFS is considering abatement options for the Officers Club and Electronic Equipment Facility (e.g., sealing the crawl space in Building 247 and installing an air/air exchanger).

2.7.2 Asbestos

A comprehensive asbestos survey was conducted in December 1990 on all of the office buildings and a sampling of the FHUs. The results of the survey are summarized in Appendix C. Most of the buildings in the survey (74 out of 119) were found to contain asbestos in pipe insulation, floor tile, and wallboard. In addition, asbestos cement piping is present throughout the facility in the water and sewer lines.

The facility has an Asbestos Management and Control Program (AMCP) to monitor the asbestos containing materials (ACMs) found in most of the buildings. Warnings are placed in areas with friable asbestos (e.g., the boiler room of the EPIC Building). According to the AMCP, removal of asbestos is not necessary unless the ACM is damaged or undergoing renovation. Annual updates of the condition of the ACM are conducted.

Asbestos removals have occurred in various buildings (e.g., the EPIC Building [Building 166] wallboard and the Administration Building [Building 160] crawl space). Asbestos wastes are currently sent to the Fauquier County Landfill or the HAM Sanitary Landfill in Peterstown, West Virginia. Both landfills are licensed asbestos landfills. However, before 1973, asbestos wastes were burned with other solid wastes and buried in Dump #1.

2.7.3 PCBs

During the Installation Assessment performed in May 1981 by ESE, three in-service transformers were observed to be leaking. Their nameplates identified them as containing Askarel, a fluid defined as polychlorinated biphenyl (PCB) liquid by the EPA. VHFS contracted to complete repairs on these transformers and all PCB-contaminated materials were removed offsite by the contractor (ESE 1981).

In 1981, a survey of the identification nameplates was performed by the Directorate of Facilities and Engineers on most of the transformers located within VHFS. These transformers were located outside various buildings across the installation. The survey identified 45 out of 113 transformers as containing PCB fluid, such as Askarel. Samples of various groups of transformer oils were performed in 1981 by Versar and in 1983 and 1987 by Emmorton Electrical Testing. However, according to VHFS, the test results were not reliable (Reisch 1993).

In 1989, all of the transformers within VHFS were tested for PCB content. The tests determined that most of the transformer oils contained PCBs. The eight transformers that were above 500 parts per million (ppm) were removed from service and taken to the Transformer Storage Area in November 1989. These transformers had up to 910,000 ppm PCBs (i.e., dielectric fluid). The eight transformers and other PCB-contaminated transformers were removed from the Transformer Storage Area by Aptus Environmental Services in two shipments on August 16, 1990 and October 29, 1990. According to hazardous waste manifests, the shipments contained 2,068 kg of >500 ppm PCB oil, 700 kg of 50 to 500 ppm PCB oil, and 950 kg of <50 ppm PCB oil. The PCB oils were disposed of in a Toxic Substance Control Act (TSCA) incinerator in Coffeyville, Kansas.

Currently, the facility is trying to retrofill all 50 to 500 ppm PCB-contaminated transformers to less than 50 ppm PCBs. The facility also plans to resample all of the transformers by 1994 to determine the accuracy of the 1989 survey and to mark all transformers currently without labels or ones that may be currently mislabeled as containing PCBs (Reisch 1993).

2.7.4 Lead Paint

Lead-based paint was applied in the FHUs and office buildings extensively in the 1940's and 1950's. Use of lead-based paint continued at a lesser pace after this time. However, as the most recent FHU construction was 1970-71, all FHUs are suspected of containing lead-based paint.

A Lead Exposure Risk Assessment (LERA) survey was completed in September 1991 of most of the buildings on the facility (a total of 282) to group them into high, medium, or low risk categories. The risk level is based on the usage of the building and the condition of the paint. The high risk homes were sampled in March and May 1993 and the medium and low risk homes will follow in preceding years. The lead-based paint was mainly used on the front door and window sills of the brick residences. Buildings with at least 0.5 percent lead (by weight) include Buildings 122B, 110B, 116A, 316A, 425B, and 411G. The maximum concentration of lead in paint was 16.1 percent.

2.7.5 Radioactive Materials

The Health Clinic (Building 137) has three diagnostic x ray machines which contain a small amount of low-level radioactive material. During a 1976 inspection, the U.S. Army Environmental Hygiene Agency (USAEHA) found no radiation hazard associated with these units (ESE 1981). The only other known radioactive materials are the tritium sources located in the emergency exit signs installed in the 1950's (Reisch 1993).

2.7.6 Unexploded Ordnance

Currently, there is no known unexploded ordnance (UXO) on the VHFS property. The ammunition magazine only holds fresh rounds for small caliber weapons and the skeet range and pistol range are used exclusively for shotgun and pistol target practices. However, an unused bazooka round was found on the VHFS property in October 1992 and subsequently was detonated in the pistol range with plastic explosives.

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3. AREAS REQUIRING ENVIRONMENTAL EVALUATION

The enhanced preliminary assessment (ENPA) team from Science Applications International Corporation (SAIC) identified 42 areas requiring environmental evaluation (AREEs) at Vint Hill Farms Station (VHFS). These AREEs include the sites identified in the U.S. Army Toxic and Hazardous Materials Agency (USATHAMA) Waste Site Report and any other potential areas of concern identified during the site inspection, file search, or interviews. The AREEs are listed in Table 3-1. Each AREE is shown in Figure 3-1 and described in a separate subsection. The description for each facility includes the types and quantities of associated hazardous wastes and materials, the dates of operation, and significant historical events or changes.

3.1 DUMP #1

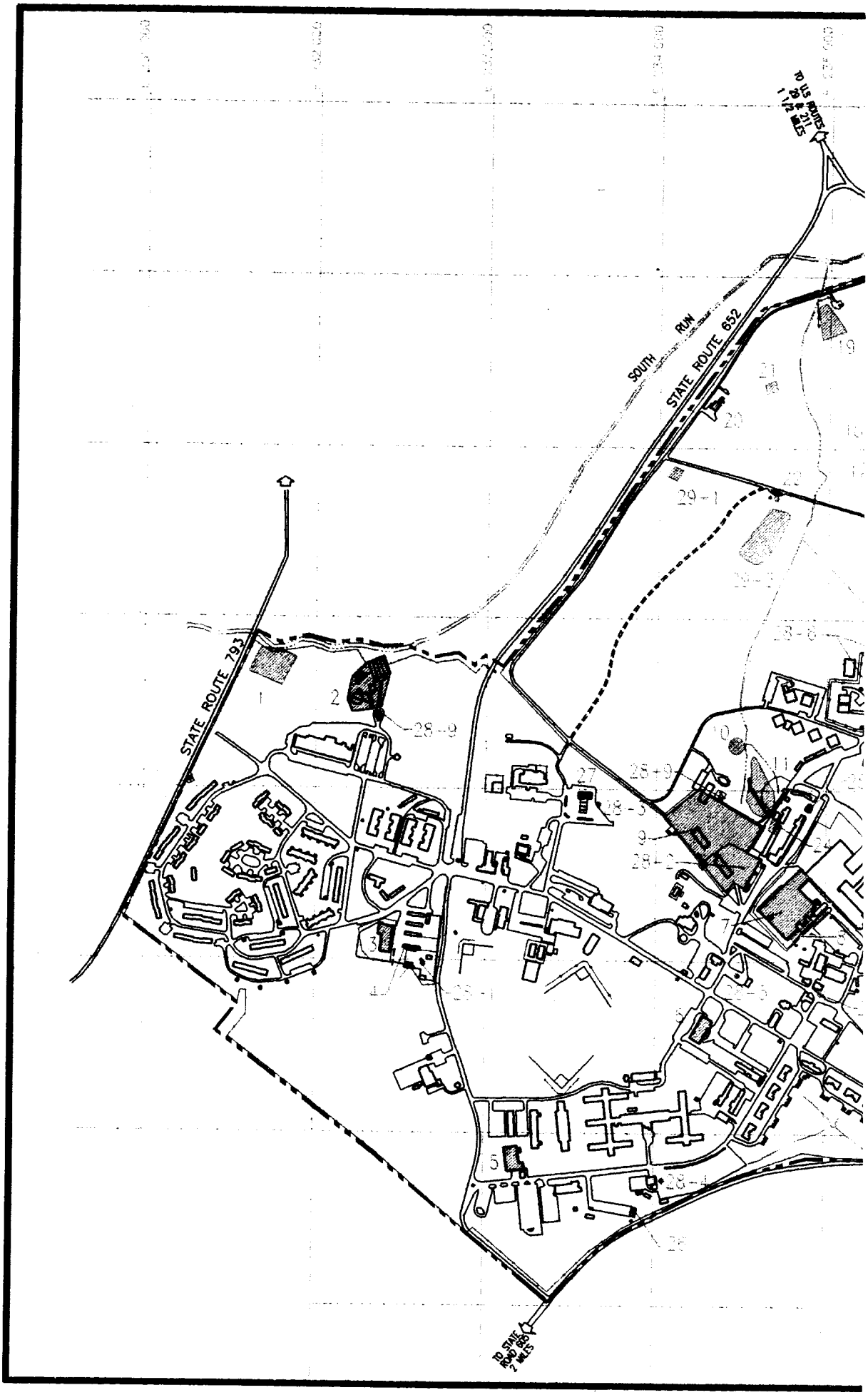
Dump #1 (AREE 1) is listed in the USATHAMA Waste Site Report as Site Number 1. This landfill was used for general refuse and installation waste disposal from 1942 to 1973. During this period, large quantities of household garbage, kitchen grease, lead-based paint residue, organic solvents, waste oil, pesticides, and sandblasting wastes were disposed of in trenches within the 5-acre dump. Open burning of asbestos sheeting also had occurred until 1973 when open burning was restricted and the Incinerator (AREE 20) was completed.

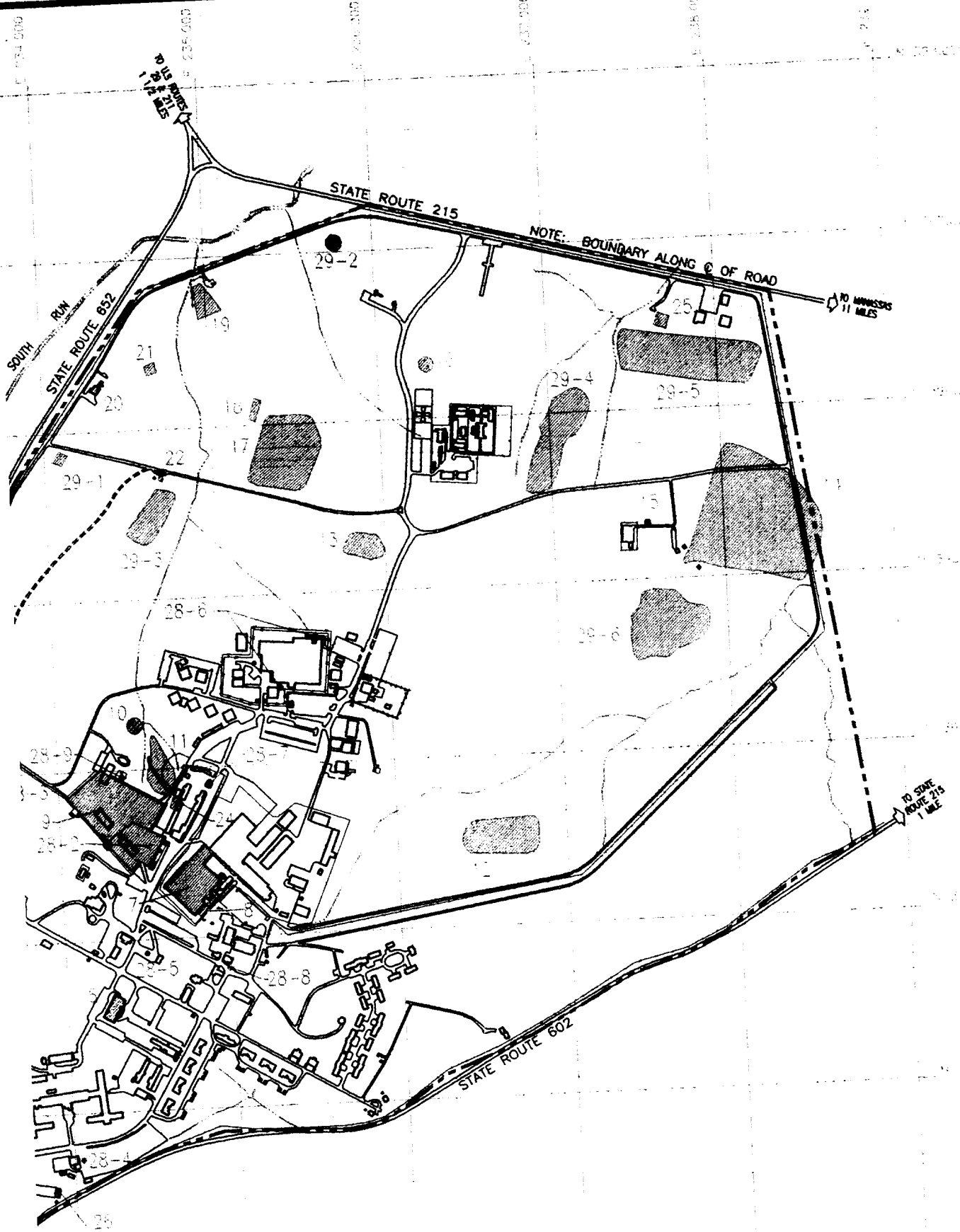
Operations consisted of trench and fill with trenches 6 to 10 feet deep being excavated and used for burning garbage and other wastes. When a trench was filled with ash and unburned residue, it was covered and another trench was excavated. When no more trenches could be excavated, trash was burned on the surface of the dump and ash and unburned residue were spread toward South Run. When the Incinerator was completed, disposal of burnable wastes was stopped and the site was used only for disposal of construction debris and other hard fill material. The present surface of Dump #1 is 18 feet above the previous land surface (ESE 1981).

Approximately 300 gallons/year of opened and surplus paint, 600 gallons/year of paint solvents (i.e., gasoline and varsol), and 500 lbs/year of sandblasting waste were disposed of in

Table 3-1. Areas Requiring Environmental Evaluation (AREEs) Vint Hill Farms Station

AREE 1	Dump #1
AREE 2	Sewage Treatment Plant
AREE 3	Warehouse
AREE 4	Auto Craft Shop
AREE 5	EPIC Building
AREE 6	Health Clinic
AREE 7	Electrical Equipment Facility
AREE 8	IMMC Neutralization Pit
AREE 9	Vehicle Maintenance Areas
AREE 10	Former Photographic Wastewater Lagoon
AREE 11	Former Sewage Treatment Plant
AREE 12	Dump #2
AREE 13	Sludge Disposal Area
AREE 14	Skeet Range
AREE 15	Hazardous Waste Storage Building
AREE 16	Firefighter Training Pit
AREE 17	Dump #3
AREE 18	Grease Pit
AREE 19	Pistol Range
AREE 20	Incinerator
AREE 21	Sand Filter Beds
AREE 22	Fixed Ammunition Magazine
AREE 23	Transformers
AREE 24	Transformer Storage Area
AREE 25	Sugar Tree
AREE 26	Outdoor Wash Racks
AREE 27	AAFES Service Station
AREE 28-1	Auto Craft Shop UST
AREE 28-2	Vehicle Maintenance Area USTs
AREE 28-3	AAFES Service Station USTs
AREE 28-4	Former Steam Plant USTs
AREE 28-5	Former Service Station Abandoned USTs
AREE 28-6	IEWD Emergency Generator USTs
AREE 28-7	Engineering Compound USTs
AREE 28-8	Power Plant UST
AREE 28-9	STP Emergency Generator USTs
AREE 29-1	Salvage Yard
AREE 29-2	Possible Sludge Disposal Area
AREE 29-3	Possible Disposal Area
AREE 29-4	Disposal Area
AREE 29-5	Liquid Impoundment Area
AREE 29-6	Possible Burn Pile


TO US ROUTES 18 & 21 1 1/2 MILES
SOUTH RUN
STATE ROUTE 652
STATE ROUTE 793
TO STATE ROAD 650 2 MILES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29-1
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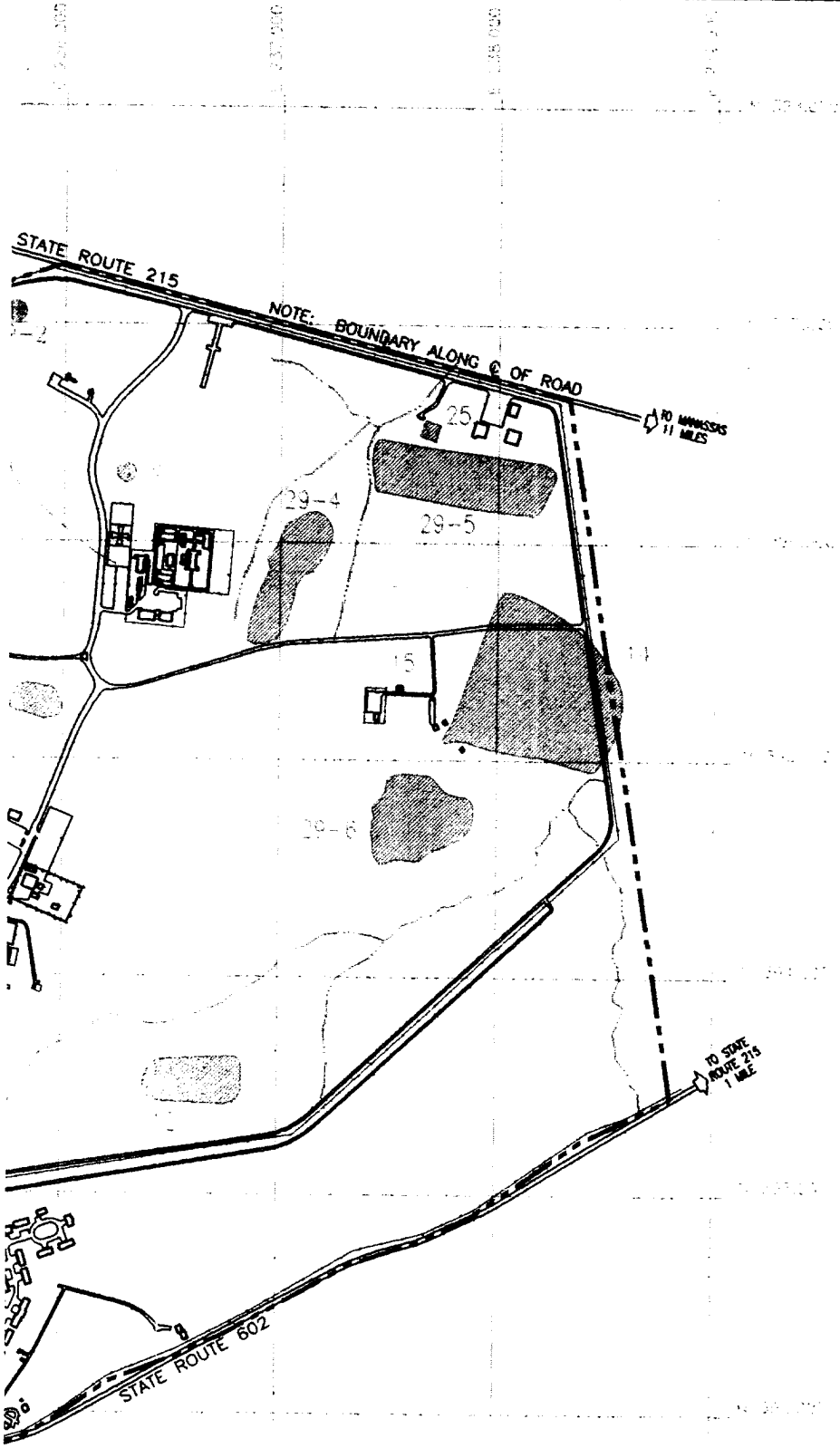


AREEs LOCATIONS:

1. . . . . .
2. . . . . .SEWAGE TREATMEI
3. . . . . .WA
4. . . . . .AUTO CRA
5. . . . . .EPIC
6. . . . . .HEALT
7. . . . . .ELECTRICAL EQUIPMENT
8. . . . . .IMMC NEUTRALIZA
9. . . . . .VEHICLE MAINTENAN
10. . . . . .FORMER PHOTOGRAPHIC WASTEWATER
11. . . . . .FORMER SEWAGE TREATMEI
12. I
13. . . . . .SLUDGE DISPOS
14. . . . . .SKEE
15. . . . . .HAZARDOUS WASTE STORAGE
16. . . . . .FIREFIGHTER TRAI
17. I
18. . . . . .GR
19. . . . . .PISTO
20. . . . . .INCI
21. . . . . .SAND FILT
22. . . . . .FIXED AMMUNITION M
23. . . . .TRANSFORMERS (LOCATED THROUGHOUT PI
24. . . . . .TRANSFORMER STORA
25. . . . . .SUG
26. . . . . .OUTDOOR WASI
27. . . . . .AAFES SERVICE
28-1 . . . . . .AUTO CRAFT SH
28-2 . . . . . .VEHICLE MAINTENANCE AR
28-3 . . . . . .AAFES SERVICE STATI
28-4 . . . . . .FORMER STEAM PLA
28-5 . . . . . .FORMER SERVICE STATION ABANDON
28-6 . . . . . .IEWD EMERGENCY GENERAT
28-7 . . . . . .ENGINEERING COMPOU
28-8 . . . . . .POWER PL
28-9 . . . STP EMERGENCY GENERATOR USTs (2 LO
29-1 . . . . . .SALVA
29-2 . . . . . .POSSIBLE SLUDGE DISPOS
29-3 . . . . . .POSSIBLE DISPOS
29-4 . . . . . .DISPOS
29-5 . . . . . .LIQUID IMPOUNDMEI
29-6 . . . . . .POSSIBLE BU

N

0 400 800 1600

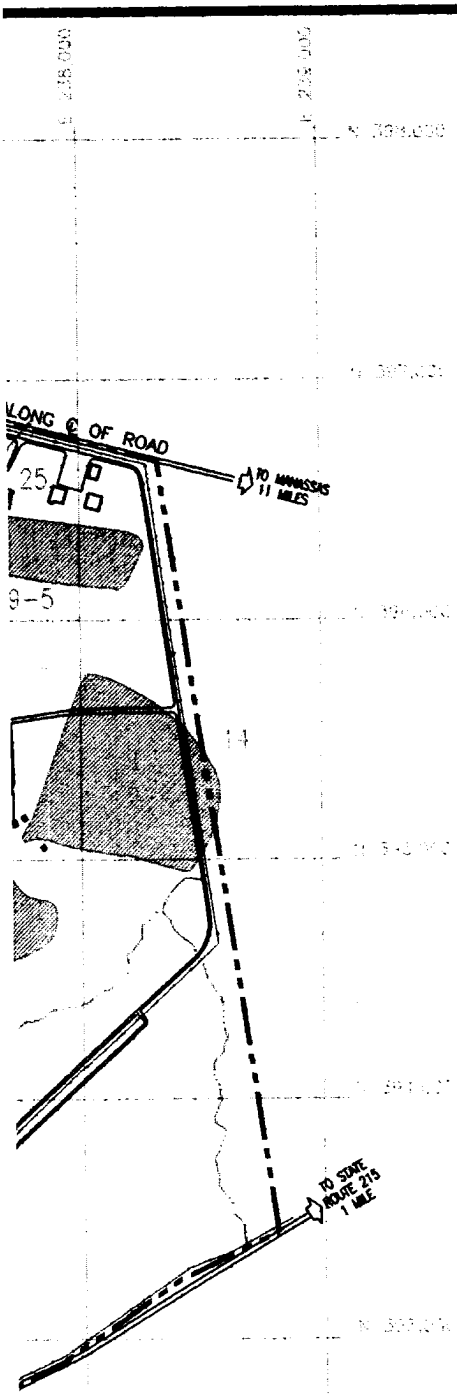
SCALE: 1" = 800'

Science Applications International Corpo

Vint Hill Farms Station
Warrenton, Virginia
Enhanced Preliminary Assessme

GENERAL LOCATION OF AREE

Figure:	Project:	File Name:
3-1	01-0827-03-6521-001	/94019/DWGS/672-AR2



AREEs LOCATIONS

1 . . . . . DUMP #1
2 . . . . . SEWAGE TREATMENT PLANT
3 . . . . . WAREHOUSE
4 . . . . . AUTO CRAFT SHOP
5 . . . . . EPIC BUILDING
6 . . . . . HEALTH CLINIC
7 . . . . . ELECTRICAL EQUIPMENT FACILITY
8 . . . . . IMMC NEUTRALIZATION PIT
9 . . . . . VEHICLE MAINTENANCE AREA
10 . . . . . FORMER PHOTOGRAPHIC WASTEWATER LAGOON
11 . . . . . FORMER SEWAGE TREATMENT PLANT
12 . . . . . DUMP #2
13 . . . . . SLUDGE DISPOSAL AREA
14 . . . . . SKEET RANGE
15 . . . . . HAZARDOUS WASTE STORAGE BUILDING
16 . . . . . FIREFIGHTER TRAINING PIT
17 . . . . . DUMP #3
18 . . . . . GREASE PIT
19 . . . . . PISTOL RANGE
20 . . . . . INCINERATOR
21 . . . . . SAND FILTER BEDS
22 . . . . . FIXED AMMUNITION MAGAZINE
23 . . . . TRANSFORMERS (LOCATED THROUGHOUT PROPERTY)
24 . . . . . TRANSFORMER STORAGE AREA
25 . . . . . SUGAR TREE
26 . . . . . OUTDOOR WASH RACKS
27 . . . . . AAFES SERVICE STATION
28-1 . . . . . AUTO CRAFT SHOP USTs
28-2 . . . . . VEHICLE MAINTENANCE AREA USTs
28-3 . . . . . AAFES SERVICE STATION USTs
28-4 . . . . . FORMER STEAM PLANT USTs
28-5 . . . . . FORMER SERVICE STATION ABANDONED USTs
28-6 . . . . . IEWD EMERGENCY GENERATOR USTs
28-7 . . . . . ENGINEERING COMPOUND USTs
28-8 . . . . . POWER PLANT UST
28-9 . . . STP EMERGENCY GENERATOR USTs (2 LOCATIONS)
29-1 . . . . . SALVAGE YARD
29-2 . . . . . POSSIBLE SLUDGE DISPOSAL AREA
29-3 . . . . . POSSIBLE DISPOSAL AREA
29-4 . . . . . DISPOSAL AREA
29-5 . . . . . LIQUID IMPOUNDMENT AREA
29-6 . . . . . POSSIBLE BURN PILE

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0 400 800 1600

SCALE: 1" = 800'

Science Applications International Corporation

Vint Hill Farms Station
Warrenton, Virginia
Enhanced Preliminary Assessment

GENERAL LOCATION OF AREEs

Figure:	Project:	File Name:	Date:
3-1	01-0827-03-6521-001	/94019/DWGS/672-AR2	04-25-94

trenches during Dump #1's operational period (ESE 1981). In addition, the facility disposed of approximately 12 tons of household garbage per working day in the dump (USAEHA 1983). It also is possible that sludge from the sewage treatment plants was disposed of within the dump. Dump #1 has been covered with grass since disposal activities were stopped in 1973.

The areas surrounding Dump #1 consist of a former salvage yard to the south, a construction material borrow pit to the west, South Run to the north, and a wooded area to the east. Solid wastes were separated in the former salvage yard to remove reusable and marketable materials (e.g., pipes, iron sheeting, copper wire, etc.). Numerous buried metallic features and an abandoned gas line were detected by electromagnetic (EM) surveys in this area.

Dump #1 has been the subject of previous site investigations due to its historical waste disposal practices. Based on 30 years of operation at the disposal rates listed above, approximately 9,000 gallons of paint, 1,800 gallons of solvents, 15,000 pounds of sandblasting wastes containing lead paint, and 90,000 tons of household garbage were burned and buried in the trenches.

To determine the groundwater quality near the site, a groundwater monitoring program was initiated in 1984. This system consists of four groundwater monitoring wells: two are set in the fractured bedrock beneath the landfill to monitor vertical contaminant migration, one is located downgradient and across South Run to determine if contaminants flow under the streambed, and one is upgradient of the landfill to monitor upgradient groundwater quality conditions. These wells are sampled annually for selected metals and volatile organic compounds (VOCs).

Leachate from the dump has been observed entering South Run. Considering the types of materials reported to have been disposed of in the landfill, migration of toxic materials may occur. However, surface water samples from a leachate seep and immediately below the toe of the landfill did not detect any primary contaminants. Chromium was detected in the landfill surface soils and stream bed sediments at 28 and 33 mg/kg, respectively. These concentrations are above the background chromium concentration of 24 mg/kg.

A site investigation is recommended at this AREE to confirm that the hazardous materials disposed of in the landfill are not entering the groundwater and South Run.

3.2 SEWAGE TREATMENT PLANT

The Sewage Treatment Plant (STP) (AREE 2) is listed in the USATHAMA Waste Site Report as Site Number 2 for the STP and Site Number 6 for the STP Chemical Laboratory. The facility also is known as Sewage Treatment Plant #2.

The STP serves 400 VHFS permanent residents and 2,000 daily employees and has been in service since 1952. The plant treats and discharges industrial and sanitary wastewaters from VHFS operations. The facility has received sanitary wastewater (from kitchens, sinks, and bathrooms), industrial wastewater (from photographic, painting, laboratory, vehicle washing, and metal etching operations), and surface water runoff (through infiltration and inflow).

Before 1973, the wastewater was treated by sedimentation and chlorination prior to discharge. Since that time, improvements have been made to the facility to bring the plant into compliance with current requirements. After the capacity of the STP was expanded in 1981, the Former Sewage Treatment Plant (AREE 11) was closed and all sanitary wastewaters were piped to the STP. In 1990, bar screen/grit chamber equipment was installed to remove large solids and grit at the headworks of the plant. An ultraviolet (UV) disinfection system was added in 1992 to replace the chlorine disinfection system. The new system would eliminate the residual chlorine formerly discharged as a result of the chlorine contact tank disinfection. Current treatment includes bar screening, grit chamber settling, coagulation with aluminum sulfate (alum), flocculation and sedimentation, biological treatment with a trickling filter, secondary clarification, and UV disinfection of the effluent.

The sludges from the settling tank and secondary clarifier are aerobically digested and then discharged to one of four sand drying beds. The drying beds were renovated in 1991 to replace the underdrainage system and install a roof. Before 1980, sludge was stored in piles onsite near South Run. Based on aerial photographs and historical practices, the sludge may have been disposed of in Dump #1 (AREE 1), Dump #3 (AREE 17), or the Possible Sludge

Disposal Area (AREE 29-2). Currently, the dried sludges are removed every 3 weeks and disposed of in the Fauquier County Landfill. Approximately 10 cubic yards per month of dried and digested sludges are generated and disposed of in the county landfill.

The facility discharges an average of 220,000 gallons/day of treated effluent to South Run. The discharge is regulated by the Virginia State Water Control Board (SWCB) through Virginia Pollutant Discharge Elimination System (VPDES) permit number VA0020460 (see Section 2.5.3). The STP has received notices of violation (NOVs) in the past for exceeding permit discharge limits. These NOVs have been settled and the SWCB recently renewed the VPDES permit.

Chlorination is no longer used to disinfect the wastewater and all chlorine has been removed from the STP. Some chlorine is still stored in a storage building near the commissary (Building 397) in case of a malfunction of the UV disinfection system. Currently, the liquid chlorine is only used for the water supply pumphouses and the two swimming pools located on Post. Canisters of chlorine gas and bags of sodium hexametaphosphate and sodium fluoride for water treatment also are stored in this building.

The aluminum sulfate (alum) used for coagulation is stored in a 6,000-gallon aboveground fiberglass tank. The tank is housed in a cinder block building that is designed to contain the entire contents of the tank in the event of a rupture.

The STP Chemical Laboratory routinely performs analyses for compliance with permit and operations parameters of the STP. Small amounts of hazardous materials are stored in the STP laboratory (Building 398) for analytical purposes. These industrial chemicals and small amounts of toxic wastes (e.g., mercuric sulfate from the chemical oxygen demand [COD] analysis) are disposed of in the sink, which leads to the head of the plant.

Effluent discharge to South Run has been monitored extensively by installation personnel and the SWCB under the VPDES permit. The discharge is sampled monthly for priority pollutants according to the VPDES permit. Levels of total suspended solids (TSS) and

biochemical oxygen demand (BOD) have been recorded that exceed permit limits. However, concentrations of heavy metals (including silver, chromium, and cyanide) have been minimal.

In July 1984, the pretreatment system at the Environmental Photographic Interpretation Center (EPIC) Building (AREE 5) failed and cyanide-containing wastewaters were discharged to South Run through the STP. Surface water sampling downstream from the STP discharge in August detected 34.0 μg/L of total cyanide and 20.5 μg/L of free cyanide (ESE 1986). These levels exceed Federal and state criteria for protection of aquatic life, but are below criteria for protection of human health. Subsequent sampling in May 1985 detected 19.1 μg/L of total cyanide and nondetectable levels of free cyanide. Recent sampling of the surface water has shown further decreases in cyanide concentrations (Chesapeake 1991).

A site investigation is recommended to determine if any residual contamination of silver, chromium, mercury, or cyanide remains as a result of the former sludge piles.

3.3 WAREHOUSE

The Warehouse (AREE 3) is listed in the USATHAMA Waste Site Report as Site Number 3. The Warehouse (Building 309) reportedly was used to store drums of oil, grease, solvent, paint, acid, and industrial organic chemicals (Weston 1990). However, at the time of the site visit, the only hazardous substances in storage were industrial cleaners and soaps, spray paint cans, and copier supplies (i.e., toner). Interviews with the manager of the Warehouse indicated that other hazardous substances may have been temporarily offloaded in the warehouse area, but none were stored in the warehouse building and no spills had occurred (Rylander 1993). In addition, most shipments of hazardous substances are delivered directly to the receiver (e.g., IEWD, IMMC, EPIC) or are brought in and out by a subcontractor (e.g., painters, lawn care personnel, insect/rodent control personnel). The Warehouse was built in 1943 and has a concrete floor. The Warehouse was, at one time, used as a vehicle maintenance area. The probable dates for such usage would coincide with the timeframe during which the Auto Craft Shop was used as the VHFS Motor Pool (1943-1967). Two sets of concrete filled pits exist in the Warehouse floor. These pits may have been used as hydraulic lifts and fluid-changing pits. A date etched in the concrete indicates 1967 as the year in which

the pits were filled. No records exist to indicate whether the pits were cleaned out prior to being filled. One floor drain, approximately 2 by 3 feet, exists at the south end of the building. The top of the drain is currently sealed off with a wooden board. No records exist to indicate when the drain was sealed at the floor level. The Warehouse sink and water fountain drainpipes run underneath the floor into the floor drain. An outflow pipe runs south from the drain basin. According to the VHFS sewer map, the outflow discharges to the field south of the Auto Craft Shop and Warehouse.

Information from the ENPA activities regarding the potential for contamination at this AREE was considered insufficient evidence for a site investigation recommendation. The Virginia DEQ has, however, requested that site investigation activities be performed at this site in order to gather data to determine whether hazardous substances are present.

3.4 AUTO CRAFT SHOP

The Auto Craft Shop (AREE 4) is listed in the USATHAMA Waste Site Report as Site Number 4. The Auto Craft Shop (Buildings 306 and 308) is where military personnel perform maintenance on their private vehicles. The buildings are used to store oil, solvents, and lubricants for these activities. The buildings have concrete floors with no curbs or floor drains to prevent the spreading of spills. Gasoline and oil spills have been recorded in this area and were cleaned up using absorbents. The Auto Craft Shop was used from 1943 to 1967 as the motor pool for VHFS.

Waste oil, previously stored in an underground storage tank (UST) (see AREE 28-1), is currently stored in a 500-gallon aboveground storage tank (AST). The 500-gallon steel AST is double-walled and is located under a roof and within a steel containment dike. The dike can contain 110 percent of the contents of the tank in the event of a spill. The tank has two compartments, each clearly labeled, for used antifreeze and waste oil. The used antifreeze, waste oil, and waste solvents are removed by private contractors and recycled.

Adjacent to Building 308 is an outdoor vehicle wash rack. Drain lines for the vehicle wash rack are connected to the storm sewer which discharges to the field south of the Auto Craft Shop. A grit chamber exists for the settling of solids prior to discharge.

Surface water runoff is diverted into a storm sewer drain, which discharges to the field south of the Auto Craft Shop. No previous sampling activities have been conducted in this area to determine if spills from the Auto Craft Shop have impacted the surrounding soils. However, it has been reported that the grass in this area has an oily sheen after a storm event (Hitt 1993).

Currently, a plume of petroleum contamination lies under the shop as a result of leaks from the Auto Craft Shop UST (AREE 28-1). It is unknown whether releases from the Auto Craft Shop have contributed to this contamination through runoff of solvent, oil, and gasoline spills to the surrounding soils or by infiltration through cracks in the pavement.

A site investigation is recommended in this area to determine if the surrounding soils are contaminated with gasoline, waste oil, solvents, or antifreeze.

3.5 EPIC BUILDING

The EPIC Building (AREE 5) is listed in the USATHAMA Waste Site Report as Site Number 5 for the EPIC Operation and Site Number 7 for the Hazardous Waste Storage Building. The STP Chemical Laboratory (USATHAMA Site 6) is mistakenly designated as being located within the EPIC Building (see AREE 2).

The U.S. Air Force (USAF) Aeronautical Chart and Information Center (ACIC) used Building 166 from 1958 to 1963 for photographic development. The building was unoccupied for the next 3 years. In 1966, the Defense Intelligence Agency (DIA) reactivated the laboratory and used it until 1971. The building was then on standby status for the next 2 years. The U.S. Environmental Protection Agency (EPA) began photographic operations in July 1973 and have used the building until the present. The facility currently develops, enlarges, and prints aerial photographs in color and black and white for EPA using the Kodak EA5 and R-3 processes.

Photographic wastewaters are acidic and may contain silver, ferric cyanide, chromium, and other photographic chemicals and cleaners. From 1958 to 1968, untreated black and white photographic wastewater containing silver was discharged to the Former Photographic Wastewater Lagoon (AREE 10) through a 6-inch industrial sewerline. In 1966, the first silver recovery units were installed for wastewater pretreatment. These units removed a large portion of the silver in the wastestream. The pond was dredged in 1968 to recover silver in the sediments and then filled in. The influent was then diverted directly into the western tributary of South Run.

An ion-exchange system was installed in 1973 to remove cyanide, ammonia, phenols, and silver from the photographic wastewater before discharge. Color as well as black and white processing occurred during this period. From 1973 to 1983, the pretreated wastewater was discharged through the industrial sewerline into the western tributary of South Run. The ion-exchange system was 80 to 90 percent effective in removing cyanide, ammonia, phenols, and silver (ESE 1986). Cyanide (177 mg/L), phenols (25 mg/L), silver (1.32 mg/L), and cadmium (0.14 mg/L) were detected during surface water sampling in April 1978 at the outfall of the sewerline to the tributary.

In October 1983, the industrial sewerline was plugged and the photographic wastewaters were discharged into the sanitary sewer. Before discharge to the sanitary sewer, the wastewaters are treated in an upgraded ion-exchange unit, which can remove 100 percent of the silver and cyanide. Two ion-exchange systems, each having two columns with resin-coated beads, are currently used to strip silver thiosulfate or ferric cyanide from the wastewater before discharge to the STP. The beads are periodically regenerated to remove the silver and cyanide.

The EPIC operation is a small quantity generator (SQG) of hazardous wastes and has its own Resource Conservation and Recovery Act (RCRA) generator identification number (VA7690590024). The hazardous wastes include fixing solution containing silver and bleach cleaner containing ferric cyanide. The fixer and the bleach cleaner are treated in the resin columns and discharged through the sanitary sewer.

Nonhazardous color developer and other hazardous wastes are stored in the Hazardous Waste Storage Building on the loading dock before removal by a private contractor. The nonhazardous color developer was prohibited from discharge to the sanitary sewer because the developer wastewater raised the chlorine requirements at the STP (AREE 2). Now that the UV disinfection system is in place, EPA wants to resume disposal of the developer wastewater in the sanitary sewer. STP personnel want a full characterization of the developer wastewater before disposal to the sanitary sewer resumes.

The EPIC Hazardous Waste Storage Building also is used to store hazardous raw materials for the Kodak EA5 and R-3 processes. The containment building has three compartments with temperature control, spill containment, and ventilation. Drums of hazardous wastes previously had been stored on the loading dock without containment.

The EPIC Building also contains a bermed satellite storage area within the chemical storage room. Hazardous materials stored in the chemical storage room include:

- EA-5 bleach in a 200-gallon fiberglass tank
- EA-5 neutralizer in a 100-gallon stainless-steel tank
- Used black and white fixer solution in a 100-gallon polyethylene tank
- Used EA-5 fixer solution in a 100-gallon polyethylene tank
- Waste systems cleaner in 55-gallon drums
- Hydrobromic acid in 55-gallon drums
- Sodium hydroxide in a 10-gallon carboy
- Ammonia, hydrochloric acid, nitric acid, phosphoric acid, glacial acetic acid, and sulfuric acid in small containers.

Floor drains in this room are plugged until spills or floor washings occur. The spills or washwaters can be directed to two 400-gallon polyethylene holding tanks in the basement or to the sanitary sewer, depending on the nature of the chemicals involved.

The EPIC Building released photographic wastewaters containing silver and ferrocyanide to the photographic wastewater lagoon (AREE 10) and the western tributary of South Run

through the industrial sewerline from 1958 to 1983. Due to the age of the pipeline and the nature of the acidic wastewaters, leakage is suspected. In addition, silver and cyanide sludges may still be in the pipeline. Infiltration of groundwater into the pipeline may carry these sludges to the surrounding soils and groundwater.

A geophysical survey of the vitrified clay pipeline in 1984 provided a qualitative estimate of the leakage from the industrial pipeline. The photographic wastewaters contained high amounts of solids and metals which, theoretically, would be detected by an EM survey. The EM survey did not detect any plumes of contaminants emanating from the pipeline (ESE 1986). However, it would take an extremely large quantity of contamination to be detected using an EM survey. Therefore, the results are considered inconclusive.

One bedrock monitoring well was installed in 1984 adjacent to the sewerline in a location where the EM survey found a ground conductivity anomaly. Contaminants above Federal MCLs have not been detected in samples collected from this shallow well and the two nearby drinking water supply wells (Well numbers 1 and 2, at 400 and 450 feet in depth, respectively).

A site investigation is recommended to confirm that no photographic wastewaters have leaked from the industrial sewerline. However, the hazardous waste storage building for the EPIC Building requires no further investigation because no evidence of releases of hazardous materials from the building exists.

3.6 HEALTH CLINIC

The Health Clinic (AREE 6) is listed in the USATHAMA Waste Site Report as Site Number 8. The Health Clinic (Building 137) has been used since 1965 for medical and dental services for installation and other military personnel.

The infectious wastes generated at the Health Clinic are double-bagged in red 25-gallon plastic bags for disposal. The medical clinic generates approximately 3½ red bags per week and the dental clinic fills an additional 3½ red bags per day (USAEHA 1983). Before April 1983, the red bags were transported to the installation Incinerator (AREE 20) for disposal. Due to the

poor condition of the Incinerator, the operators believed that handling the red bags involved a health risk and declined to accept further shipments. Since April 1983, the medical wastes have been sent to the Fort Belvoir MEDDAC incinerator.

The clinic also has three diagnostic x-ray machines, which contain a small amount of low-level radioactive material. During a 1976 inspection, USAEHA detected no radiation hazard associated with these units (ESE 1981).

No further investigation is recommended at this facility because historical evidence and records suggest that no medical or radiological contamination has been released from this facility.

3.7 ELECTRICAL EQUIPMENT FACILITY

The Electrical Equipment Facility (AREE 7) is listed in the USATHAMA Waste Site Report as Site Number 9. The Electrical Equipment Facility has been used since 1965 for various classified military activities within the Intelligence Materiel Management Center (IMMC). The facility (Building 2410) used several hazardous paints, photographic chemicals, and metal-cleaning liquids during the operational period. After use, the paints and cleaners were drained from the appropriate bins into a drainage network that leads to a concrete-lined impoundment located adjacent to Building 2410 (i.e., the Pretreatment Tank). The acidic photographic wastewaters were neutralized in the IMMC Neutralization Pit (AREE 8) before discharge to the pretreatment tank.

Currently, the painting and photographic operations have been discontinued and the metal etching operations are used infrequently. All activities using hazardous materials are being moved to Building 2472.

The Pretreatment Tank was installed in 1978 and is approximately 6 feet long, 4 feet wide, and 5 feet deep, with concrete sides and bottom. The tank contains a layer of rock and a layer of sand to filter the wastewaters before discharge to the sanitary sewer. Overflow from the sand filter enters the sanitary sewer directly. The water discharges to the sanitary sewer in

the area of manhole 29-1 and flows in a northwest direction towards the lift station and ultimately to the STP. Approximately 200 gallons/month of waste chromic acid from the metal etching operations, painting wastewaters, and photographic wastewaters (from the Neutralization Pit) entered the Pretreatment Tank from 1978 to 1990. Currently, only 50 gallons/month of chromic acid from the monthly metal etching operations enter the Pretreatment Tank.

All floor drains discharge spills and floor washwaters to the Pretreatment Tank from 1978 to 1990. Before 1979, all floor drains discharged directly to the western South Run tributary through outfall 401.

The sand sludge in the Pretreatment Tank is removed annually and disposed of as hazardous waste by the Defense Reutilization Management Office (DRMO) because of its high concentrations of chromium, silver, and lead. Before 1981, the sand sludge was disposed of in the Sludge Disposal Area (AREE 13).

Chemicals stored in the building include chemical agent resistant coating (CARC) paint, thinners, iridite (used in acid etching and metal cleaning), deoxidizer, aluminum etch #2, cleaning solvents, waste solvent, and residue from sandblasting. Spills of these chemicals enter the Pretreatment Tank through the floor drains. In the future, most of these chemicals will be moved to Building 2472.

Used solvents and other hazardous wastes are stored in 55-gallon drums outside the building in a hazardous materials satellite accumulation area. The holding area is a concrete containment building with berms to prevent spills and leaks from reaching the surrounding soils. The hazardous materials are eventually taken to the Hazardous Waste Storage Building (AREE 15).

Unused hazardous materials are stored in a fireproof building (Building 292) outside of the Electrical Equipment Facility. The building is used to store assorted paints, thinner, ammonia, ferric chloride, methyl ethyl ketone (MEK), toluene, aluminum etching powder, hydraulic fluid, and cylinders of argon and oxygen.

Surface water and sediment sampling was conducted in April 1978 at the outlet of the floor drains to the western South Run tributary (Outfall 401). Small amounts of cadmium, mercury, and cyanide were detected in the surface water and moderate amounts of chromium, mercury, and silver were detected in the sediments (see Appendix D).

Because of the types of chemicals used in the building, the drain lines beneath the facility and the Pretreatment Tank may have corroded. Two recently drilled monitoring wells are located near the pretreatment tank. Although sampled, the results are unknown at this time.

The Pretreatment Tank wastewater was tested in April 1992 using the toxicity characteristic leaching procedure (TCLP). These analyses detected benzene, chloroform, MEK, barium, cadmium, lead, and chromium at leachable concentrations. Although detected, all concentrations were below levels that would classify the wastewater as hazardous.

A site investigation of the Pretreatment Tank is recommended to determine if wastewaters are leaking to the surrounding soils and perched water table.

3.8 IMMC NEUTRALIZATION PIT

The IMMC Neutralization Pit (AREE 8) is not listed in the USATHAMA Waste Site Report, but is associated with the Electrical Equipment Facility (AREE 7). The IMMC Neutralization Pit, constructed in 1964, was connected to two photographic developing sinks inside the Electrical Equipment Facility. The Neutralization Pit measures 4 feet on each side and is 5 feet deep with 6-inch thick concrete sides and an unlined earthen bottom. During its operational period, the pit contained a layer of sand over a layer of limestone. An underdrain pipe carried the filtered and neutralized wastewater to the Pretreatment Tank (see AREE 7). In the event of an emergency, an overflow pipe in the pit allowed the acidic, silver-bearing photographic wastewater to flow directly to the sanitary sewer.

During excavation for limestone replacement in 1990, it was discovered that the bottom of the Neutralization Pit was not concrete. Subsequently, all sinks leading to the Neutralization

Pit were plugged and the IMMC Neutralization Pit was taken out of service. All photographic chemical wastes are currently containerized and taken to the Hazardous Waste Storage Building.

A site characterization is currently in progress to determine the extent of soil and groundwater contamination from the Neutralization Pit. The sewer line from the Neutralization Pit to the Pretreatment Tank also is suspected to be leaking. The site characterization will be completed by mid 1994.

Four soil borings, one groundwater well, and one sample from the Neutralization Pit were collected in April 1991. Concentrations of metals and VOCs above background levels were detected in the soils and perched groundwater. Arsenic was detected above soil action levels, while cyanide, mercury, nitrate, methylene chloride, trichloroethene, and tetrachloroethene were above maximum contaminant levels (MCLs) in the perched groundwater (see Appendix D).

3.9 VEHICLE MAINTENANCE AREA

The Vehicle Maintenance Area (AREE 9) is listed in the USATHAMA Waste Site Report as Site Number 10. The VHFS vehicles are maintained at the Civilian Motor Pool (Building 288), while the vehicles for the 201st Military Intelligence Battalion are maintained in the Military Motor Pool (Building 290). The two maintenance areas have been used since 1967 and are separated by a fence. The buildings both have wash racks and grease racks for vehicle maintenance activities. Drains from the wash racks lead to grit chambers, which discharge to the western South Run tributary, while drains from the grease racks discharge directly to the sanitary sewer.

The Vehicle Maintenance Area has a designated area for hazardous waste and materials storage. The area is fenced and contains a roofed 10- by 10-foot bermed concrete pad. Four polyethylene ASTs, installed in 1990, are on the pad for waste oil (300-gallon capacity), transmission fluid (200-gallon capacity), dry cleaning solvent (200-gallon capacity), and used antifreeze (200-gallon capacity). Used oil filters and used batteries also are stored on the pad. In addition, the pad is used to store hazardous raw materials, including oils, solvents, and

antifreeze. Five-gallon cans of gasoline and paint are stored off the pad, but within the fenced area. The hazardous wastes are periodically removed by a private contractor.

Drums of unused antifreeze and oil are stored in the Civilian Motor Pool. During the site visit, seven empty oil drums were stored on the asphalt pavement outside Building 288. Used oil is generated at approximately one 55-gallon drum/month (USAEHA 1983).

Four gas pumps are in the eastern portion of the Vehicle Maintenance Area for dispensing gasoline and diesel fuel from two 2,000-gallon diesel tanks and one 10,000-gallon gasoline tank (see AREE 28-2). The Fuel Pump House (Building 287) is used for filling civilian, government, and military vehicles. One 55-gallon drum of motor oil and one 55-gallon drum of antifreeze are stored in this building. A cinder block building (Building 289) outside the Civilian Motor Pool is used for paint storage.

The fire department has reported numerous spill incidents in this area and many stains were observed on the asphalt during the site visit. However, most spills were contained before they reached the stormwater drain.

A site investigation of the storm sewer discharge to the western South Run tributary is recommended.

3.10 FORMER PHOTOGRAPHIC WASTEWATER LAGOON

The Former Photographic Wastewater Lagoon (AREE 10) is listed in the USATHAMA Waste Site Report as Site Number 11. The Former Photographic Wastewater Lagoon was an earthen holding pond approximately 90 feet in diameter and 4.5 feet deep. From 1958 to 1968, photographic wastewaters from the EPIC Building (AREE 5) were discharged to the lagoon. The black and white photographic wastewater was acidic and contained significant amounts of silver. The overflow from the lagoon discharged to the western South Run tributary. In 1968, flow problems developed in the pond and the lagoon was dredged to recover silver from the sediments. The lagoon was then filled in and effluent was diverted directly to the South Run tributary. The lagoon has not been used since this time.

Currently, the former lagoon is partially covered by an asphalt parking lot for the 201st Military Intelligence Battalion and two warehouses. The remainder of the area is covered by grass. A sewage lift station is nearby, which pumps wastewaters to the STP (AREE 2). The station has a 550-gallon diesel UST for the emergency pump generator.

During its operational period from 1958 to 1968, silver entered the lagoon at a rate of 100 kg/year and dissolved silver in the South Run tributary reached concentrations of 0.213 mg/L (ESE 1981). Silver concentrations in the South Run tributary in 1978 were 1.32 mg/L in the surface water and 2.0 mg/kg in the sediments.

A site investigation is recommended to determine if residual contamination within the lagoon area is discharging to the western South Run tributary.

3.11 FORMER SEWAGE TREATMENT PLANT

The Former Sewage Treatment Plant (AREE 11) is listed in the USATHAMA Waste Site Report as Site Number 12. The Former Sewage Treatment Plant was constructed in 1943 to treat the sanitary wastewaters at VHFS. The Sewage Treatment Plant (AREE 2) was constructed later in 1952 to increase the treatment capacity and allow additional on-Post housing. The Former Sewage Treatment Plant was demolished in place and then covered in 1981. A Dyncorp storage lot for vehicles and construction materials currently covers half of the area. The remainder of the area is grassed.

During plant closure, the sludges in the drying beds and sludge piles were disposed of in the Sludge Disposal Area (AREE 13) and the structures were drained and razed. During excavation for the construction of the Dyncorp storage lot, additional structures associated with the Former Treatment Plant were found.

The plant originally used only sedimentation and chlorination to treat the sanitary wastewaters before discharge to the western South Run tributary. The discharge was monitored by the Virginia SWCB through NPDES permit number VA0002569. Approximately 67,000 gallons/day were discharged during its operational period. A trickling filter was added later as

biological treatment. The sludges from the sedimentation tank were dried in sludge-drying beds and then stored onsite in piles near the western South Run Tributary.

During its operational period, the Former Sewage Treatment Plant discharged a minimum of hazardous contaminants. An April 1978 sampling of the plant effluent did not detect any primary pollutants, with the exception of phenols (0.02 mg/L) and mercury (0.001 mg/L).

The dried sludge stored in piles near the western South Run tributary contained silver (250 mg/kg), mercury (40 mg/kg), and chromium (40 mg/kg). An April 1978 sampling of the sediments in the South Run tributary detected silver (56 mg/kg), mercury (6.2 mg/kg), and chromium (94 mg/kg) above background levels. Groundwater monitoring was required under the previous VPDES permit for the plant. Silver, mercury, chromium, phenols, and cyanide were not detected in a bedrock monitoring well downgradient from the treatment plant.

A site investigation is recommended to determine if residual contamination from the former sludge piles have impacted the soils and groundwater in the area.

3.12 DUMP #2

Dump #2 (AREE 12) is listed in the USATHAMA Waste Site Report as Site Number 17. Aerial photographs indicate that Dump #2 has been used as a construction debris disposal area since 1958. Extensive ground scarring and piles of dark material were observed in the photographs. An active access road led to the site from the Patrol Road.

In 1983, VHFS obtained Solid Waste Disposal Facility Permit #423 from the Virginia Department of Waste Management (VDWM) to dispose of inert construction debris in Dump #2. Approximately 3 tons/month of debris waste (e.g., concrete, asphalt, wood, and miscellaneous metals) were disposed of in the 1-acre dump. Asbestos wastes also may have been disposed of in the dump.

VHFS closed Dump #2 in 1985. The compacted fill material was covered with 18 inches of clay and 6 inches of top soil. The area was then seeded with grass.

Information from the ENPA activities regarding the potential for contamination at this AREE was considered insufficient evidence for a site investigation recommendation. The Virginia DEQ has, however, requested that site investigation activities be performed at this site in order to gather data to determine whether hazardous substances are present.

3.13 SLUDGE DISPOSAL AREA

The Sludge Disposal Area (AREE 13) is listed in the USATHAMA Waste Site Report as Site Number 18. The Sludge Disposal Area is located in the antenna fields in the north-central portion of the installation, near the intersection of West and Bicher Roads. The area was used during the 1980's to dispose of sludge from the Sewage Treatment Plant (AREE 2) and Former Sewage Treatment Plant (AREE 11). The sewage sludges were analyzed for total metals in 1982 and were found to be sufficiently low for land spreading (38 mg/kg silver, 5 mg/kg arsenic, 1.6 mg/kg cadmium, 45 mg/kg lead, and 3.4 mg/kg mercury). The 75-foot diameter and 3-foot high sludge pile also received 200 gallons/year of sand filter sludge (containing metal etching wastes) and sandblasting waste (containing lead paint) from the Electrical Equipment Facility (AREE 7). In June 1992, the area was dredged and closed by order of the Virginia SWCB. Twenty thousand cubic feet of sludge were excavated, dried, and transported to the Fauquier County Landfill. Currently, the area is level, grassed, and barely distinguishable from the surrounding area. Metals above background concentrations were not detected in surficial soil samples collected in this area after the sludges were removed.

Cyanide, phenols, and ammonia were detected in 1984 in three monitoring wells downgradient of the area (ESE 1986). Sources could be the Sludge Disposal Area, Former Photographic Wastewater Lagoon, or the western South Run tributary. Cyanide and phenols were not detected in the two subsequently collected groundwater samples.

A site investigation is recommended in this area to confirm that no residual soil or groundwater contamination is present.

3.14 SKEET RANGE

The Skeet Range (AREE 14) is listed in the USATHAMA Waste Site Report as Site Number 19. The outdoor Skeet Range has been used since 1961 for shotgun target practice on the weekends. The Skeet Range firing fan is oriented north and eastward in an 800-foot radius. The spent ammunition (i.e., lead shotgun pellets) is spread out over the range and is not recovered. An archery range and a proposed golf driving range are southeast of the Skeet Range.

Metallic lead in shotgun pellets will not leach to the surrounding soils under normal circumstances (i.e., nonacidic environments) (NRA 1990). However, lead fragments and dust may form more soluble and toxic compounds containing lead (i.e., organometallic compounds) (Berc 1989). Soluble lead could migrate with infiltrating rainwater to the groundwater. The soils in the VHFS area are generally considered to be acidic (pH range 5.0 to 6.0). Fertilizer, such as lime, or other grass treatments will greatly affect the surface soil pH (Hatch 1994).

A site investigation is recommended in this area to determine if soluble lead has contaminated the subsurface soils.

3.15 HAZARDOUS WASTE STORAGE BUILDING

The Hazardous Waste Storage Building (AREE 15) is listed in the USATHAMA Waste Site Report as Site Number 20. The Hazardous Waste Storage Building (Building 700), which is a less-than-ninety day accumulation area, was constructed in 1990 and is used to store hazardous and nonhazardous wastes and hazardous substances. The building is not a RCRA permitted facility. Before 1990, hazardous wastes were stored at the facility that generated the wastes. The materials are stored on a roofed and fenced concrete pad with no floor drains or curb. The hazardous materials are stored in 55- and 25-gallon drums, on containment pallets, and in a hazardous waste storage cabinet. Salvageable hazardous materials (e.g., partially used toluene containers) are sent to the Property Disposal Office (PDO) at Fort Belvoir, while nonsalvageable hazardous wastes and substances are removed by the DRMO.

The materials present at the time of the site inspection included:

- Drums of DS_2—a caustic decontamination solvent
- Eight drums of contaminated soil from borings at the AAFES Service Station
- Six drums of contaminated water from a solvent spill in the storm sewer
- Drums of absorbent from various gasoline cleanups
- Used batteries on containment pallets
- Photographic developer from the IMMC microfiche machine
- Urethane foam resin
- Toner
- Naphtha.

No evidence of past spills was observed on the pad or in the surrounding vegetation. No further action is recommended for this facility because there is no historical or visual evidence that spills of hazardous wastes or substances have occurred.

3.16 FIREFIGHTER TRAINING PIT

The Firefighter Training Pit (AREE 16) is listed in the USATHAMA Waste Site Report as Site Number 21. The Firefighter Training Pit was formerly used by the VHFS Fire Department for training once each month during the mid-1970's (Hitt 1993). The 56-foot unlined pit was approximately 3 feet deep. During training activities, the pit was partially filled with petroleum and natural gas odorant and then ignited. Solvents and other burnables also may have been used in the pit.

During its 3- to 4-year operational period, up to fifty 55-gallon drums of waste oil and two 1,500-gallon tanks of JP-4 were stored on an unbermed area south of the pit. These materials were removed in 1981 and donated to the Carlett County Fire Department (ESE 1981).

Fire-fighting activities ended in the late 1970's and the pit has not been used since this time. In the mid-1980's, the pit was filled with ½ inch gravel, reportedly from the trickling filter (Hitt 1993). Training is currently performed at the Fauquier County fire training facilities.

During the visual inspection, no surficial petroleum contamination was observed in the area. The closest downgradient monitoring well is 800 feet south of the pit and screens the bedrock groundwater. No contaminants have been detected in this well.

A site investigation is recommended in this area to determine if residual petroleum and solvents have contaminated the subsurface soils beneath the pit.

3.17 DUMP #3

Dump #3 (AREE 17) is not listed in the USATHAMA Waste Site Report, but has been traditionally grouped with the Grease Pit (AREE 18). Dump #3 has been used to dispose of compost materials (i.e., leaves, branches, grass, and tree stumps) and construction debris (i.e., "clean fill" such as soil, asphalt, and concrete). Sludge from the two STPs also may have been disposed of in Dump #3. According to aerial photographs, the area has been used since 1958 as a disposal area (EPIC 1983). The dump is approximately 390 by 318 feet and a 300-by 318-foot section is currently surrounded by a low wire fence.

The area was freshly plowed and leveled during the second visual inspection in October 1993. All construction debris and nondegradable materials were sent to the Fauquier County Landfill. The dump will be used in the future only for composting.

Small amounts of sandblasting waste containing lead paint from the Electrical Equipment Facility (AREE 7) may have been disposed of in this area (O'Neill 1993). In addition, some household waste and empty insecticide bottles were observed in the dump during the first visual inspection in September 1993. Material was disposed of over this fence at various points around the dump. One bedrock monitoring well was installed downgradient from the area in 1984.

A site investigation is recommended in this area to determine if any hazardous materials were disposed of in the dump.

3.18 GREASE PIT

The Grease Pit (AREE 18) is listed in the USATHAMA Waste Site Report as Site Number 22. The Grease Pit was reportedly 50 feet long, 2 feet wide, and 4 feet deep (Weston 1990). The trench was used to dispose of kitchen grease and oily rags. Motor oils also may have been disposed of in the trench. The pit was covered in 1981 and has not been used for oil or grease disposal since this time. Currently, ground scars cover a 25- by 70-foot area within which the grease pit was contained.

Two USTs, used to store diesel oil for the Manassas Family Housing Site, were placed on the covered trench in 1988 (Reisch 1993). The tanks were removed from this area in 1993. Ground scarring indicates where the tanks were recently excavated. In addition, some debris from a trickling filter, fiberglass insulation, 10-foot lengths of rusted ductile iron pipe, and a tank fill pipe with attached concrete were found near the pit. Most of the oils should have been remediated through natural biodegradation. However, used motor oils contain metals, which would persist in the subsurface environment.

A site investigation is recommended in this area to determine if the oils contained leachable metals or solvents.

3.19 PISTOL RANGE

The Pistol Range (AREE 19) is listed in the USATHAMA Waste Site Report as Site Number 23. The Pistol Range has been used since 1961 for limited target practices. The 100- by 200-foot area is surrounded partially by a fence. The firing fan is directed southward toward a horseshoe-shaped dirt bank, which captures the bullets. Weapons used at the pistol range include .22, .32, .38, and .45 caliber handguns. Spent ammunition is not recovered, but shell casings are collected and returned to the Fixed Ammunition Magazine (AREE 22). The facility was used once for detonation of a bazooka round. However, no other known instances of open detonation of unexploded ordnance have occurred.

Metallic lead found in bullets will not leach to the surrounding soils under normal circumstances (i.e., nonacidic environments) (NRA 1990). However, lead fragments and dust

may form more soluble and toxic compounds (i.e., organometallic compounds) (Berc 1989). Soluble lead could migrate with infiltrating rainwater to the groundwater or with surface runoff to the western South Run tributary. The soils in the VHFS area generally considered to be acidic (pH 5.0 to 6.0). Fertilizer, such as lime or other grass treatments, will greatly affect the surface soil pH (Hatch 1994).

One bedrock monitoring well is located downgradient from the range. No dissolved lead was detected during a 1984 sampling of the groundwater. In addition, dissolved lead has not been detected in surface water samples in the adjacent western South Run tributary.

A site investigation is recommended in this area to determine if soluble lead has impacted subsurface soils or if soluble lead is being transported with the stormwater runoff to the surrounding soils.

3.20 INCINERATOR

The Incinerator (AREE 20) is listed in the USATHAMA Waste Site Report as Site Number 24. The Incinerator (Building 282) was used from 1973 to 1985 to burn household and office garbage. Medical wastes from the Medical Clinic also were accepted at the facility until April 1983. The two-chambered incinerator (Scientific Ecology Model DACA 31-72) has a design capacity of 2 tons/hr for type 1 wastes (i.e., household garbage) and has produced an 89 percent weight reduction from garbage to ash. During its period of operation, the facility received approximately 12 tons of solid waste each day. The ash and nonburnables were then sent to the Fauquier County Landfill.

The Incinerator was closed from 1985 to 1987 for renovations. After restarting in April 1987, the Incinerator shut down in July 1987 when a series of explosions in the furnace damaged the structure. The Incinerator was rarely operated properly, primarily due to inexperienced operators and a lack of preventative maintenance (USAEHA 1983). The Incinerator has not been used since this time and all VHFS solid waste is taken to the Fauquier County Landfill. The Incinerator currently is used for overflow storage. The Virginia APCB considers the facility

permanently closed (Clayton 1993). Although most of the ash has been removed from the structure, some residual still remains in the ducts and furnace.

The facility also received many nonburnable materials, including auto parts, hazardous household refuse (e.g., car batteries, solvents, pesticides, etc.), and all types of metal. Most of these materials were removed before incineration, but some of the materials may have inadvertently entered the furnace.

Air pollution controls included a stack gas scrubber and a baffle system. The scrubber used water sprays for particulate control in the smokestack (i.e., a wet scrubber). The wastewater from the scrubber was discharged through a 6-inch pipe to the Sand Filter Beds (AREE 21), which lie 300 feet northeast of the Incinerator.

A 500-gallon septic tank and 135-foot leach field lie north of the facility. The septic system is connected to the sinks, toilets, and floor drains in the Incinerator building. There is no record of hazardous wastes having been disposed of in the septic system.

Hazardous materials have been disposed of in the incinerator. The high temperatures would have destroyed most of the contaminants, but the residual ash will contain high levels of soluble metals. Currently, the residual ash is contained within the building. Spills of liquid hazardous wastes (e.g., solvents, pesticides and waste oils) would have been captured by the floor drains and discharged to the septic system. All floor washings also were discharged to the septic system.

A site investigation is recommended in this area to determine if hazardous wastes were disposed of in the septic tank and released to the surrounding environment.

3.21 SAND FILTER BEDS

The Sand Filter Beds (AREE 21) are not listed in the USATHAMA Waste Site Report, but are connected to the Incinerator (AREE 20). The Sand Filter Beds received the ash wastewaters from the wet scrubber, which is used for particulate control in the Incinerator

smokestack. The two beds are each 10 by 25 feet and have 12-inch thick concrete walls (USACE 1973). However, the bottoms of the beds are unlined. The 3.5-foot deep beds contain a 2.5-foot layer of coarse sand (0.5 mm diameter) and 1 foot of filter gravel (½- to 1-inch diameter) to filter particulates from the wastewater. An underdrain system in the gravel captured the filtered particulates from the ash wastewater and drained to a distribution box, which discharged through perforated pipe to a leach field north of the Sand Filter Beds. The beds are currently uncovered and filled with weeds. According to facility personnel, the beds have never been cleaned out to remove the ash particulate (Reisch 1993).

Hazardous materials (e.g., solvents, pesticides, and waste oil) have been disposed of in the Incinerator. The high temperature would have destroyed most of the contaminants, but the residual ash will contain high levels of metals. Unknown levels of contaminants are present in the sand beds, distribution box, piping, and leach field, which received the Incinerator ash. The leach field drains into the western South Run tributary, which has had elevated levels of cyanide, phenols, and mercury in the surface water.

A site investigation is recommended in this area to determine if the soils beneath the filter beds or in the absorption field are contaminated with ash leachate or if ash leachate is entering the South Run tributary.

3.22 FIXED AMMUNITION MAGAZINE

The Fixed Ammunition Magazine (AREE 22) is listed in the USATHAMA Waste Site Report as Site Number 25. The Fixed Ammunition Magazine (Building 285) is a 20- by 10-foot cinder block building used for ammunition storage since 1949. No floor drains exist in the building, and approximately 5,000 rounds of ammunition are in storage for use at the Pistol Range (AREE 19) (Weston 1990). In accordance with Army regulations for ammunition magazines, a 40-foot area of cleared grass surrounds the magazine as a fire control measure. Clearance has been done only by mechanical means since at least 1991. There is no available information regarding prior clearance methods.

No further action is recommended at this facility because no hazardous wastes have been stored in the magazine and no evidence of releases of hazardous substances to the environment exists.

3.23 TRANSFORMERS

The Transformers (AREE 23) are listed in the USATHAMA Waste Site Report as Site Number 26. According to a 1989 survey, 131 active transformers are located throughout VHFS. Twenty of these transformers contain PCBs in their cooling oil at concentrations between 50 and 500 ppm. The remaining transformers are under 50 ppm PCBs. VHFS is currently instituting a program to resample all of their transformers and retrofill any PCB-contaminated transformers until they contain less than 50 ppm PCBs. Inactive transformers (i.e., new transformers and transformers that have been taken out of service) are temporarily stored in the Transformer Storage Area (AREE 24).

No oil spills were observed around any transformers during the site inspection. The historical transformer oil spills are discussed in Section 4.

No further investigation is recommended because the transformers will be resampled and replaced as necessary. The issue of PCBs in transformer oil is discussed in Section 2.7.3.

3.24 TRANSFORMER STORAGE AREA

The Transformer Storage Area (AREE 24) is not listed in the USATHAMA Waste Site Report. The Transformer Storage Area is located west of Building 272 in the Engineering Compound. This unbermed asphalt area was used to store PCB transformers (i.e., PCBs in oil greater than 500 ppm) and PCB-contaminated transformers (i.e., PCBs in oil between 50 and 500 ppm) before removal by Aptus Environmental Services in 1990. The area is currently used for general storage of materials on pallets, including new "non-PCB" transformers. The area also has been used to store drums containing oil and fuel filters (Reisch 1992). A 400-gallon used oil storage tank is located nearby inside a covered containment pad.

Any spills of transformer cooling oil would migrate toward the western South Run tributary. However, no spills were observed or recorded in this area.

An environmental survey of 30 VHFS buildings was conducted in 1989. During the survey, it was noted that six 55-gallon waste motor oil drums in the Engineering Complex (near AREE 24) were leaking and had saturated the surrounding soil.

Information from the ENPA activities regarding the potential for contamination at this AREE was considered insufficient evidence for a site investigation recommendation. The Virginia DEQ has, however, requested that site investigation activities be performed at this site in order to gather data to determine whether hazardous substances are present. Section 2.7.3 provides more information on PCB transformers.

3.25 SUGAR TREE

Sugar Tree (AREE 25) is not listed in the USATHAMA Waste Site Report. Small amounts of paints and solvents may have been disposed of in the area. However, no stressed vegetation or other evidence of contamination was observed in the area. During the visual inspection, nine 5-gallon gas tanks and a 200-gallon diesel AST with plastic sheeting for secondary containment were observed near the area.

Information from the ENPA activities regarding the potential for contamination at this AREE was considered insufficient evidence for a site investigation recommendation. The Virginia DEQ has, however, requested that site investigation activities be performed at this site in order to gather data to determine whether hazardous substances are present.

3.26 OUTDOOR WASH RACKS

The Outdoor Wash Racks (AREE 26) are not listed in the USATHAMA Waste Site Report. The Outdoor Wash Racks are two concrete facilities that are used by VHFS personnel to clean their vehicles. They were constructed in April 1982 to replace two wash racks that were previously located near the area, in the middle of what is now a parking area. Each wash rack has 12-inch concrete berms to prevent runoff and a ramped entrance to prevent run-on.

Drains from the racks lead to a grit chamber, which discharges the effluent to the sanitary sewer.

The grit chamber and adjacent sewage lift station have been saturated with oil due to vehicle maintenance activities performed while on the racks (Reisch 1993). In February 1992, the grit chamber and the sewage lift station were steam cleaned and all fluid and sediments were drummed and removed. The fluids and sediments were removed by DRMO for disposal as hazardous wastes. Samples from the chamber contained 360,000 mg/L of TPH with a gas chromatography/mass spectrometry (GC/MS) "fingerprint" for motor oil and gasoline. In addition, small amounts of benzene, toluene, ethylbenzene, and xylene (BTEX); lead; and antifreeze were detected in the fluids and sediments. The wastewater also contained surfactants and phosphorus from cleaning solutions.

The grit chamber currently is filled with sediment and has an oily sheen with an obvious petroleum smell. However, the concrete sides of the chamber are in good condition with no cracks or leaks evident. The condition of the bottom of the chamber is unknown. During storm events, oily wastes may be flushed out of the grit chamber to the storm sewer. A dumpster is located nearby, which contains household garbage and empty antifreeze and oil containers.

A site investigation is recommended at the wash racks, as well as at the previous wash rack location (underneath the parking area), to determine if the oily wastewaters have contaminated the surrounding soils.

3.27 AAFES SERVICE STATION

The AAFES Service Station (AREE 27) is not listed in the USATHAMA Waste Site Report. The AAFES Service Station (Building 238) was constructed in 1969 to provide fuel for VHFS vehicles. The service station contains pumps for three grades of gasoline and a service area with two lifts. In addition, a fenced storage area is located in the rear of the facility for tires, batteries, and drums.

Many spills of gasoline and oil (e.g., a snow shovel knocked over a gas pump in March 1993) have occurred in this area. Oil stains were observed on the asphalt and in the surrounding vegetation in aerial photographs (EPIC 1983). There was also one instance of a battery acid spill in the service bay area. Drains in the area lead to a grit chamber, which discharges to a field north of the facility.

A site investigation is recommended at this facility to determine if the discharge from the grit chamber has contaminated the surrounding soils.

3.28 UNDERGROUND STORAGE TANKS

Nine of the identified AREEs are USTs or former UST locations. Size, location, and other information regarding these USTs is presented in detail below. Information regarding VHFS UST permits is provided in Section 2.5.6 of this report. Table 2-3 provides summary information about active USTs at VHFS. Table 2-4 provides summary information about all known removed, replaced, and abandoned USTs at VHFS.

3.28.1 Auto Craft Shop UST

The Auto Craft Shop UST (AREE 28-1) is listed in the USATHAMA Waste Site Report as Site Number 15. The Auto Craft Shop UST was a 1,000-gallon waste oil tank located near the Auto Craft Shop (AREE 4). The users of the craft shop would pour waste oil into the tank and often spill oil on the pavement in the process (Hitt 1993). In addition, other liquid wastes from the Auto Craft Shop (e.g., solvents, brake fluid, and antifreeze) may have been poured into the tank. The tank contents were removed from the tank periodically by a private contractor. The tank may have been used to store gasoline or diesel fuel while the Auto Craft Shop functioned as the motor pool for VHFS.

The waste oil tank was installed during the 1940's, and Program Resources, Inc. (PRI) removed and disposed of the tank in July 1990. The only soil that was excavated during the tank removal was what was necessary to allow for removing the tank. The excavation was then refilled with 21A gravel and covered with asphalt. The excavated soil was hauled to a disposal

facility. Currently, one drum of petroleum-contaminated water from groundwater sampling activities remain in the area of the former UST.

High levels of petroleum hydrocarbons and volatile organics were detected in the soil during the tank removal in July 1990 (2,000 mg/kg total petroleum hydrocarbons [TPH]; 880 parts per billion [ppb] benzene; 6,700 ppb toluene; 2,700 ppb ethylbenzene; and 28,000 ppb xylenes). These levels are in excess of the state mandated level for remedial action. Polychlorinated biphenyls (PCBs) were not detected and leachable metals (i.e., 0.42 mg/L barium and 0.03 mg/L lead) were below hazardous concentrations.

Subsequent soil sampling in August 1990 detected petroleum and solvent contamination in the surrounding soils and groundwater. Eleven soil borings were drilled and three flush-mounted monitoring wells were installed in the area.

The contaminants from the tank had migrated down to the perched water table at 8 feet below land surface (BLS) and then flowed south-southwest with the groundwater. The plume is estimated to be 30 by 50 feet. One inch of free product (waste oil) was detected on top of the water table at the closest downgradient monitoring well.

The petroleum hydrocarbons from the soil and groundwater samples have a gasoline signature. This may indicate use of the tank for fuel storage while the Auto Craft Shop acted as the motor pool for VHFS. 1,1,1-Trichloroethane (1,1,1-TCA) and 2-butanone, which are common solvents, also were detected in the soil samples. Complete sampling results are presented in Appendix D.

VHFS submitted a site characterization report to the SWCB in 1990. The SWCB requested a revised site characterization plan, which required the extent of soil and groundwater contamination, aquifer properties, effects of fractures on groundwater flow, and potential receptors surrounding the site. VHFS submitted a revised site characterization report to the Virginia SWCB in 1992 to remediate the groundwater plume using an OWS, air stripper, and carbon filter before discharge to the STP. Currently, the SWCB has not approved the revised

site characterization plan. No site investigation is recommended for this area because the installation's action is ongoing.

3.28.2 Vehicle Maintenance Area USTs

The Vehicle Maintenance Area USTs (AREE 28-2) are listed in the USATHAMA Waste Site Report as 3 of the 14 USTs at Site Number 16. Two 2,000-gallon steel diesel tanks installed in 1982 and one 10,000-gallon fiberglass gasoline tank installed in 1990 are located in the Vehicle Maintenance Area (AREE 9). The previous 12,000-gallon steel gasoline tank was removed in 1990 and replaced with a fiberglass tank with leak detection wells and overfill protection. All three tanks have passed vacuum pressure leak testing and are inventoried on a monthly basis. VHFS plans to double-wall the distribution pipes in the future and replace the diesel tanks with ASTs.

No soil samples were obtained during the removal of the 12,000-gallon steel tank. However, most of the soils surrounding the tank were removed to make room for the new 10,000-gallon fiberglass tank. The soil and rock subsequently were disposed of in Dump #3. No visible petroleum contamination was observed in the soils during the tank replacement (Reisch 1993).

No further investigation is recommended for these tanks because no evidence of petroleum releases to the surrounding soils exists.

3.28.3 AAFES Service Station USTs

The AAFES Service Station USTs (AREE 28-3) is listed in the USATHAMA Waste Site Report as 4 of the 14 USTs at Site Number 16. The AAFES Service Station USTs are located southeast of the AAFES Service Station (AREE 27). Three 10,000-gallon tanks are used for three grades of unleaded gasoline and one 550-gallon tank is used for waste oil from the vehicle servicing operations. Previous documentation states that one of the tanks contained leaded gasoline, although all gasoline tanks currently contain unleaded gasoline. All tanks are steel and were installed in 1969. Each gasoline tank has a throughput of more than 200,000 gallons/year

and has been recently leak tested. The facility plans to remove the USTs at the AAFES Service Station and not replace them.

On April 20, 1993, pressure testing conducted on the distribution piping determined that the regular unleaded line was leaking. The lines were then excavated to pinpoint the source of the leak. Approximately 15 gallons of free product and four 55-gallon drums of contaminated soil and sand were collected from the excavated area and disposed of as hazardous waste. The corroded pipe was repaired and the excavated area was backfilled and resurfaced.

A plume of petroleum contamination with a GC/MC "fingerprint" for leaded gasoline was detected in the monitoring wells downgradient from the USTs. The contamination plume has travelled in a northeast direction from the station and is approximately 700 feet long by 200 feet wide. A site characterization report and corrective action plan are currently in progress to determine the extent of the groundwater contamination and remedial actions required.

3.28.4 Former Steam Plant USTs

The Former Steam Plant USTs (AREE 28-4) are listed in the USATHAMA Waste Site Report as Site Number 13. The Former Steam Plant USTs were installed in February 1978 to store fuel oil for the generators in the Steam Plant (Building 161). The two 30,000-gallon tanks were constructed of steel. The Steam Plant has been inactive since 1988 when the Administration Building (Building 160) switched from steam heat to natural gas furnaces. The steel tanks subsequently were removed in December 1990.

As part of the closure plan, five soil borings were drilled adjacent to the USTs and four confirmatory soil samples were collected from under the USTs after their removal. The soil borings were completed to depths of 5 feet below the perched water table (20 to 25 feet) and split spoon samples were collected every 5 feet. Headspace air samples did not have detectable quantities of VOCs. The confirmatory soil samples were all below or at the method detection limit of 16 ppm for TPH. No further investigation is recommended for this facility.

3.28.5 Former Service Station Abandoned USTs

The Former Service Station Abandoned USTs (AREE 28-5) are listed in the USATHAMA Waste Site Report as Site Number 14. The Former Service Station Abandoned USTs are located underneath the Former Service Station (Building 220) parking lot. The two steel tanks were in service until the service station closed in 1983 and had contained an unknown quantity of gasoline. Upon closure, the tanks were emptied of petroleum product and then filled with sand and concrete to the surface. The tanks were never leak tested and the date of installation is unknown. Building 220 was initially constructed in 1925, but the date of its conversion to a service station is unknown.

Due to the unknown age of the steel tanks, in addition to the lack of leak detection and cathodic protection, the tanks may have leaked to the surrounding soils. A site investigation is recommended at this area to determine if residual petroleum contamination exists in the soils and groundwater.

3.28.6 IEWD Emergency Generator USTs

The IEWD Emergency Generator USTs (AREE 28-6) are listed in the USATHAMA Waste Site Report as 4 of the 14 USTs at Site Number 16. The IEWD Emergency Generator USTs are four steel tanks that are used to store diesel fuel for seven emergency generators. The three steel tanks adjacent to Building 261 are 2,000, 8,000, and 15,000 gallons, while the tank adjacent to Building 264 is 5,000 gallons. The tanks were installed in 1985, 1951, 1967, and 1944, respectively. The 2,000-gallon tank replaced a similar 2,000-gallon tank that was installed in 1951. The tanks recently have passed vacuum pressure leak tests. However, the tanks have no corrosion protection or overfill protection. Approximately 500 gallons of fuel are used each year during the infrequent power outages.

The tanks are checked monthly and are filled out once per year. No irregularities in the tank inventories have occurred, with the exception of the 8,000-gallon tank. This tank contained 2 inches of water due to infiltration of surface water through the below-grade fill pipe (Acree 1993). The water was removed and a 2-foot stickup pipe was installed in 1992. No water has been reported in the tank since this time. The tanks have passed vacuum pressure leak

tests. Thus, no evidence of releases exists and no further investigation is recommended for these tanks.

3.28.7 Engineering Compound USTs

The Engineering Compound USTs (AREE 28-7) are listed in the USATHAMA Waste Site Report as 2 of the 14 USTs at Site Number 16. The Engineering Compound USTs are two 1,000-gallon tanks of super unleaded and regular unleaded gasoline that are used to fuel the Dyncorp vehicles. The steel gasoline tanks are located in the Engineering Compound outside Building 248. The date of tank installation is unknown, but may coincide with the construction of the Engineering Compound in 1944. The Virginia SWCB lists these tanks as containing diesel fuel and being located outside Building 250. However, according to facility personnel, no USTs have ever been located outside Building 250.

The tanks have passed tightness testing and are monitored periodically, although they have no corrosion or overfill protection. Thus, no further investigation is recommended at these tanks because no evidence of releases of contaminants to the environment exists.

3.28.8 Power Plant UST

The Power Plant UST (AREE 28-8) is listed in the USATHAMA Waste Site Report as 1 of the 14 USTs at Site Number 16. The Power Plant UST is a diesel tank that serves the emergency generator within the Power Plant (Building 227). Automatic pumps fill a 250-gallon day tank inside the Power Plant from the tank. This 2,000-gallon steel tank was installed in 1985 and has passed leak testing, but has no corrosion or overfill protection. The tank has an annual throughput of approximately 150 gallons/year. The tank replaced a 1,000-gallon steel tank that was installed in 1944.

The tank is only 8 years old and has passed vacuum pressure testing. Thus, no further investigation is recommended at this tank because no evidence of releases of contaminants to the environment exists.

3.28.9 STP Emergency Generator USTs

The STP Emergency Generator USTs (AREE 28-9) are not listed in the USATHAMA Waste Site Report. The STP Emergency Generator USTs are two 550-gallon steel tanks used to store diesel fuel that were installed in 1978 to serve the emergency generators at the Sewage Lift Station (Building 205) and the Sewage Treatment Plant (Building 398). These tanks have no corrosion or overfill protection. However, both tanks have been leak tested and found to be tight. No further investigation is recommended because no evidence of releases of contaminants to the environment exists.

3.29 OTHER AREAS IDENTIFIED BY AERIAL PHOTOGRAPHY

Aerial photography, conducted by the EPA Photographic Interpretation Center (EPIC) between 1937 and 1982, has identified numerous areas as potential waste sites. These sites are located in the northern area of the facility where many temporary antenna arrays are set up for drills and experiments. Remnants of gravel roads, electrical boxes, and small amounts of construction debris mark these locations. A walk-through of all of these areas was conducted on October 19, 1993. The potential waste sites identified by aerial photography are described below.

3.29.1 Salvage Yard

The Salvage Yard (AREE 29-1) is listed as site number 3 in the EPIC aerial photographs. This site is located in the northwest section of VHFS, near Route 652, across the installation road from the Incinerator (AREE 20). Review of 1974 aerial photographs identified a small fenced salvage yard containing drums and debris. In 1977, the ground in the enclosure was scarred, and two mounds of material were identified inside the area. Review of 1982 aerial photographs showed that the facility had been removed. Neither aerial photographs nor discussions with Post personnel showed evidence indicating that hazardous materials were released in this area. The walk-through, conducted in October 1993, did not reveal any signs of salvage yard activity. Information from the ENPA activities regarding the potential for contamination at this AREE was considered insufficient evidence for a site investigation recommendation. The Virginia DEQ has, however, requested that site investigation activities

be performed at this site in order to gather data to determine whether hazardous substances are present.

3.29.2 Possible Sludge Disposal Area

The Possible Sludge Disposal Area (AREE 29-2) is listed as site number 6 in the EPIC aerial photographs. This site is located near the far northernmost boundary of VHFS, near Route 215. Review of 1977 and 1978 aerial photographs indicated scarred ground and a pile of gray material, possibly sludge, to be present in this area. The site walk-through in October 1993 revealed a stand of trees in the area that may be 10 to 15 years old. The ground within the treed area was extremely uneven indicating that material had been piled on the ground in the past. A site investigation is recommended for this area based on the aerial photography and visual inspection findings.

3.29.3 Possible Disposal Area

The Possible Disposal Area (AREE 29-3) is listed as site number 7 in the EPIC aerial photographs. This site is located southeast of the Fixed Ammunition Magazine (AREE 22). The western South Run tributary flows just to the east of the area. Review of 1950 aerial photographs indicated possible disposal activities due to ground scarring and the presence of mounds of material and possible equipment. Review of 1958 photographs indicated that the area was revegetating and the ammunition storage building had been constructed nearby. The aerial photography review primarily notes ground scarring as the basis for classification of this area as a possible disposal area. Evidence from the review suggests that the mounded materials present in this area are soil. Neither aerial photographs nor discussions with Post personnel showed evidence indicating that hazardous materials were released in this area. The walk-through revealed no evidence of dumping; however, small persistent areas of ground scarring exist. Information from the ENPA activities regarding the potential for contamination at this AREE was considered insufficient evidence for a site investigation recommendation. The Virginia DEQ has, however, requested that site investigation activities be performed at this site in order to gather data to determine whether hazardous substances are present.

3.29.4 Disposal Area

The Disposal Area (AREE 29-4) is listed as site number 14 in the EPIC aerial photographs. This site is located near the northeast corner of VHFS, northwest of the Skeet Range (AREE 14). Review of aerial photographs of this area showed signs of disposal activities as early as 1958. These signs were visible to various extents as late as 1977. By 1982, the area was grass-covered with the exception of two groves of trees at the end of the site. A total of five distinct areas are located within the Disposal Area. Two areas were used for construction debris disposal and are now enclosed within groves of mature trees. Another area is an approximately 30-foot wide depression in the ground where water collects after rain events. It is not known whether the area was used to obtain fill material or for liquid disposal. The last two areas were an orange mound area and an orange/brown stain area that are both currently level and covered with grass. It is not known what materials were stored in these areas. A site investigation is recommended for this area based on aerial photography and visual inspection findings.

3.29.5 Liquid Impoundment Area

The Liquid Impoundment Area (AREE 29-5) is listed as site number 15 in the EPIC aerial photographs. This site is located to the northeast of site 14, in the antenna fields in the northeast corner of VHFS. Aerial photographs taken in 1965 showed a large rectangular area of ground scarring along with a liquid impoundment area in the southwest corner. By 1974, no activity was indicated in the photographs. However, slight soil discoloration, possibly natural in origin, was observed. Bare soil areas persisted within this site in the 1977 and 1982 photographs. The ground scarring was probably the result of the ongoing antenna field construction and maintenance. The liquid impoundment area was only active in the 1965 photograph, and no evidence exists from either the aerial photography review or interviews to indicate that hazardous materials were stored or released in the impoundment area. The walk-through revealed no evidence of previous activity in this area, other than the construction of antenna fields. Information from the ENPA activities regarding the potential for contamination at this AREE was considered insufficient evidence for a site investigation recommendation. The Virginia DEQ has, however, requested that site investigation activities be performed at this site in order to gather data to determine whether hazardous substances are present.

3.29.6 Possible Burn Pile

The Possible Burn Pile (AREE 29-6) is listed as site number 17 in the EPIC aerial photographs. This site is located in the southeast corner of the installation, south of the Skeet Range. In 1977, a large area of ground scarring was observed, with a sizable pile of dark material on the west side of the site that was noted as a probable burn pile. Some ground scarring remained in 1978, with most of the area having revegetated. No changes were noted after that date. The ground scarring was possibly the result of the antenna array construction. The burn pile was only evident in the 1977 photograph, and no evidence exists from either the aerial photography review or interviews to indicate that contaminants were released to the environment from the burn pile. The walk-through revealed no evidence of a burn pile; however, patches of ground scarring remain in the area. Information from the ENPA activities regarding the potential for contamination at this AREE was considered insufficient evidence for a site investigation recommendation. The Virginia DEQ has, however, requested that site investigation activities be performed at this site in order to gather data to determine whether hazardous substances are present.

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4. KNOWN AND SUSPECTED RELEASES

Science Applications International Corporation (SAIC) identified releases to groundwater, surface water, soil, air, and other natural resources at Vint Hill Farms Station (VHFS) through file searches, review of previous studies, interviews, and research at county and state regulatory offices. The identified documented, suspected, and potential releases are discussed in this section and grouped by affected media. Where available, all sampling results are included in Appendix D of this report.

4.1 RELEASES TO GROUNDWATER

The Auto Craft Shop (Building 306) (AREE 4) previously contained an underground waste oil storage tank that was leaking into the surrounding soils. The tank was excavated and removed in July 1990. A site characterization was conducted at the area and groundwater monitoring wells were installed. Analytical data from the wells indicated that the groundwater in the vicinity of the removed tank was contaminated with petroleum hydrocarbons (Appendix D). A revised site characterization report and recommended remediation changes have been submitted to the Virginia State Water Control Board (SWCB) for groundwater remediation.

A site characterization was conducted at the Intelligence Materiel Management Center (IMMC) Neutralization Pit (AREE 8) outside Building 2410 in January 1991. The unlined neutralization pit was used as a waste management unit for photographic developing waste from 1964 until May 1990. Cyanide, mercury, nitrate, methylene chloride, tetrachloroethene (PCE), and trichloroethene (TCE) were detected in groundwater samples at levels in excess of current or proposed maximum contaminant levels (MCLs) for drinking water (Appendix D). A corrective action plan will be submitted in the future for soil and groundwater remediation.

The AAFES Service Station underground storage tanks (USTs) (AREE 28-3) have leaked petroleum products to the surrounding soils and perched groundwater (Reisch 1993). The contamination plume has travelled in a northeast direction from the station and is approximately

700 feet long and 200 feet wide. A site characterization is in process to determine the extent of the groundwater contamination.

Sampling data from the 1986 Environmental Contamination Survey indicate that a narrow cyanide-contaminated groundwater plume exists below the South Run tributary. This plume may be the result of migration from the Former Photographic Wastewater Lagoon (AREE 10) and discharge of pretreated wastewater from the Environmental Photographic Interpretation Center (EPIC) outfall into the tributary. Summaries of 1981 and 1984 groundwater sampling data are provided in Appendix D of this report.

Potential releases to the groundwater include migration of fuel leaks from the 16 active USTs at VHFS, and leaching of wastes from the 5 known land disposal areas (i.e., Dump #1 [AREE 1], Dump #2 [AREE 12], Dump #3 [AREE 17], Grease Pit [AREE 18], and Former Photographic Wastewater Lagoon [AREE 10]). Although no analytical data currently exist, these AREEs are considered potential sources of contaminated releases to the environment based on historical evidence and conversations with facility personnel.

4.2 RELEASES TO SURFACE WATER

In August 1993, a VHFS maintenance person discovered a solvent spill in a storm sewer near one of the southwest Family Housing Units (FHUs) (Building 414). The solvent and water were drummed and disposed of as hazardous waste. Although not confirmed, VHFS personnel believe that the release may have been caused by the lead paint abatement contractors disposing of their waste solvents into the storm sewer (Hitt 1993).

There have been four documented instances of nondisinfected treated effluent discharging from the Sewage Treatment Plant (AREE 2) to South Run and one release of raw sewage into an unnamed tributary of South Run. On February 23, 1993, approximately 21,000 gallons of nondisinfected effluent flowed to South Run while the ultraviolet (UV) disinfection system was being repaired. On May 10, 1992, 5,000 gallons of nondisinfected effluent flowed to South Run due to a water line break that caused a loss in the chlorine make-up water. On June 1, 1992, 43,540 gallons of nondisinfected effluent flowed to South Run, when there was a loss of chlorine

due to a faulty cylinder scale. In addition, on March 24, 1992, 81,000 gallons of raw sewage overflowed the Parshall flume and flowed to a tributary of South Run when a contractor hit a water line at the facility.

On August 12, 1990, approximately 55 gallons of hydraulic oil spilled at Building 290 (Military Motor Pool) (AREE 9) during deployment exercises for Desert Shield. The oil was cleaned up with a sand absorbent. No migration to the storm sewer was evident; however, runoff from the area may have flowed to the nearby intermittent stream, and to the western South Run tributary. In addition, an unknown quantity of diesel fuel spilled while personnel were draining a tank. The fuel spill entered the storm drain system. Booms were used to contain the spill, and the VHFS Fire Chief estimates that almost all of the spill was contained. The oil and fuel spills were reported to the Virginia Department of Emergency Service (DES) and the Virginia SWCB. A spill of DS_2, a caustic agent used to decontaminate vehicles, also was noted in the parking lot. The spill was cleaned up with an absorbent and no migration to the storm sewer was reported.

On March 30, 1989, between 2 and 5 gallons of methylene chloride were allegedly illegally dumped near Building 163 into a storm drain inlet. The storm drain flows to Kettle Run. The storm drain system was flushed and pumped out into a tanker truck to remediate the spill. The National Response Center (NRC) was notified of the spill.

From July 22 to 27, 1984, the pretreatment system at the EPIC Building (Building 166) (AREE 5) failed and photographic wastewaters containing cyanide were discharged to the Sewage Treatment Plant. The Sewage Treatment Plant effluent was discolored with complexed cyanide, and South Run had a blue discoloration for several hundred yards downstream. Summaries of surface water and sediment sampling data from South Run are provided in Appendix D of this report.

From 1958 until 1968, photographic wastewaters from the EPIC Building discharged to the Former Photographic Wastewater Lagoon (AREE 10), and the overflow from the lagoon flowed to the western South Run tributary. From 1968 until 1983, photographic wastewaters

from the EPIC Building were released directly to the tributary after pretreatment to remove most of the cyanide and silver. In October 1983, an improved pretreatment system was installed at EPIC and the effluent was diverted to the Sewage Treatment Plant. Summaries of surface water and sediment sampling data from the western tributary of South Run are provided in Appendix D of this report.

Several spills were listed in the Spill Prevention Control and Countermeasure (SPCC) Plan for which exact dates were not given, although it is known that they occurred before May 1988. These releases are as follows:

- At the Fuel Pump House (Building 287) (AREE 9), a small amount of waste oil overflowed from a 55-gallon drum after being displaced by rainfall during a storm. The overflow drained to the storm sewer.
- At the EPIC Building (Building 166), a sump pump that pumps wastewater to the sewage treatment plant failed in December 1986. This caused the sump drain to overflow, and dilute, nonhazardous developing chemicals flowed out the side door of the basement of the facility and into a nearby storm sewer.
- The Sewage Treatment Plant is an area of potential release to surface water as its effluent flows directly to South Run. Other potential releases include runoff from the wash racks and automobile maintenance areas on the installation that could flow to South Run or Kettle Run via the intermittent streams.

4.3 RELEASES TO SOIL

On May 10, 1993, a spill of approximately 11 gallons of diesel fuel and 48 gallons of gasoline occurred at Building 287 (Fuel Pump House) (AREE 9) due to a leak in the distribution hose. The spill leaked onto the surrounding concrete island and into the sand fill material around the pumps. The contaminated sand was removed, along with absorbent material, and disposed of as nonhazardous waste. A subsequent smaller spill of approximately ¼ gallon of diesel fuel occurred 2 or 3 days later. A study currently is being conducted to determine appropriate upgrades to prevent such spills from occurring in the future.

On April 20, 1993, pressure testing at Building 238 (AAFES Service Station) (AREE 27) determined that one of the UST distribution lines for unleaded gasoline was leaking. Exploratory excavation was performed, and four 55-gallon drums of contaminated soil were

excavated. The corroded section of line was replaced and the pumps were returned to service. A site characterization is being conducted in this area to determine the extent of soil contamination.

On March 14, 1993, a gasoline spill of unknown quantity occurred at Building 238 (AAFES Service Station) when a snow shovel pushed over the gasoline pumps. In addition, various small-quantity gasoline and oil spills have occurred at the facility over the years due to customer mishaps. Other small-quantity fuel and oil spills occur occasionally in the Auto Craft Shop (Building 306) (AREE 4). Runoff from these areas may impact surrounding soils.

There have been several instances of sewage overflow at the Sewage Treatment Plant (AREE 2) due to flood conditions. On March 17, 1993, 30,000 gallons of sewage overflowed the main lift station's Parshall flume because of rain and snow. On March 5, 1993, rain caused 150,000 gallons of sewage to overflow the grit chamber at the treatment plant. On March 24, 1992, 81,000 gallons of sewage overflowed the Parshall flume due to a contractor hitting a water line at the facility. The sewage flowed overland to South Run.

In addition, several instances of sewage overflow at manholes have occurred around the facility. On December 3, 1992, sewage overflowed a manhole next to FHU 429H due to a blockage in the line created by a buildup of sticks, stones, grease, and rags. Approximately 100 gallons of raw sewage overflowed onto the ground. Approximately 55,000 gallons of raw sewage overflowed onto the ground outside the Community Center (Building 200) on November 30, 1992, due to line blockage. One hundred gallons of sewage had overflowed at the same area 3 days earlier. The line was treated with a degreasing agent.

Concentrations of metals, cyanide, and solvents above background were detected in the soil in the vicinity of the Electrical Equipment Facility (Building 268) (AREE 7) near the former unlined neutralization pit during the January 1991 site characterization. A corrective action plan is in process to remediate the soils.

In August 1990, the underground waste oil storage tank located in the vicinity of the Auto Craft Shop was removed. It was determined that the tank had been leaking into the surrounding soil. The extent of soil contamination greater than 100 parts per million (ppm) total petroleum hydrocarbons (TPH) was estimated to be limited to an area within 5 feet of the excavation based on analytical results.

On June 9, 1990, approximately 3 gallons of battery acid spilled into the service bay floor drain at Building 283 (AAFES Service Station). The floor drain outfalls to a grit chamber that drains into an open field. Soils in the open field may have been affected by this spill. The spill was neutralized with lime.

An environmental survey of 30 VHFS buildings was conducted in 1989. During the survey, it was noted that six 55-gallon waste motor oil drums in the Engineering Complex (near AREE 24) were leaking and had saturated the surrounding soil.

Several spills were listed in the SPCC Plan for which exact dates were not given, although it is known that these spills occurred before May 1988. These releases are as follows:

- At Building 398 (Sewage Treatment Plant), the supernate discharge outlet of the aerobic digester became clogged with a rag, which subsequently dislodged and caused a surge of supernate to overload the recirculating pump. This resulted in the flooding of the pump station with approximately 1,000 gallons of supernate overflow. The spill was contained within the plant grounds. The digester subsequently was cleaned thoroughly and returned to operation.
- At Building 290 (Civilian Motor Pool) (AREE 9), various small spills of waste oil from the 55-gallon drums that were stored on pallets in an open storage area have occurred. It was observed that the earth beneath the pallets was saturated with oil. Spill dates are not known.
- At Building 205 (Sewage Lift Station) (AREE 28-9), there were several instances of sewage overflow to the surrounding ground due to pump failure or electrical service failure.

Potential releases to the soil at VHFS also include petroleum-based fuel leaks from the 16 active USTs, and runoff from the wash racks and automobile maintenance facilities on the installation.

4.4 RELEASES TO AIR

Ongoing sources of air releases include the classified document incinerators, the building heating boilers, the laboratory hoods at the Sewage Treatment Plant (AREE 2), and small quantities of lead emissions from the pistol and skeet ranges.

Radon gas was detected in concentrations in the above average range (4 to 20 pCi/L) in four buildings at VHFS (Buildings 230, 247, 268, and 398). Although remediation is not required by the EPA or U.S. Army in this range, VHFS is considering abatement options for Building 247 (Officers Club) and Building 268 (Electrical Equipment Facility) (AREE 7) (e.g., sealing the crawl space in Building 247 and installing an air/air exchanger).

On November 21, 1991, a strong chemical smell was noticed in Building 2410 (Electrical Equipment Facility). The smell was determined to be a spill of E-6, which is a chemical containing formaldehyde that is used in the photography laboratory. All chemicals contained in the storage room (i.e., E-6, paints, sealers, lacquers) were removed and properly segregated. The room was then thoroughly decontaminated.

On December 29, 1989, approximately 7 to 10 pounds of chlorine gas escaped to the atmosphere from a 150-pound cylinder at the Sewage Treatment Plant. The release was caused by a faulty regulator valve. The Virginia Emergency Operations Center and the Virginia Air Pollution Control Board (APCB) were notified of the release.

From 1973 to 1985 and from March to June 1987, the Incinerator (AREE 20) was used to incinerate household and office garbage. Air emissions were discharged from a smokestack equipped with a wet scrubber for particulate control. The majority of the monthly inspection reports noted no violations at the Incinerator; however, one violation was documented in July 1973. Fifty percent opacity smoke was issuing from the Incinerator due to the burning of wet cardboard and operator oversight.

In June 1972, a complaint was filed against VHFS with the Virginia APCB. The complaint stemmed from open burning of asbestos sheeting at Dump #1 (AREE 1), which

produced dense black smoke. A meeting was held at VHFS to discuss open burning restrictions. No open burning was performed after 1973.

A potential source of air releases is asbestos, which was found in almost all FHUs and office buildings sampled. In addition, it was noted in the 1989 Environmental Liability Assessment that asbestos from vehicle brakes was not being properly disposed of in the Auto Craft Shop workplace (Building 306) (AREE 4).

4.5 OTHER RELEASES

According to the VHFS Fire Chief, an anhydrous ammonia leak occurred at the Sewage Treatment Plant Laboratory (Building 398) (AREE 2) sometime during the past 3 years. The leak was contained within the building and was cleaned up.

Hazardous waste manifest number 1182501, dated October 23, 1991, listed a 161-pound drum of ethyl alcohol spill residue as one of the items being transported. The drum was being stored in the Hazardous Waste Storage Building (Building 700) (AREE 15). Information regarding the location and nature of this spill is unknown.

On November 20, 1989, a lithium battery exploded in Building 260 (IEWD). The explosion occurred on a concrete floor, and was contained entirely within the building.

On November 7, 1989, between 1 and 6 gallons of dielectric fluid containing 600,000 ppm of polychlorinated biphenyls (PCBs) leaked from a transformer in the equipment room in the Post Theater (Building 188). The NRC and the U.S. Environmental Protection Agency (EPA) were notified of the spill. The spill was contained within the building and cleaned up by a contractor. All transformers in the equipment room were drained. Wipe tests indicated that the spill was properly remediated.

5. HUMAN AND ENVIRONMENTAL RECEPTORS

This section identifies the human and environmental targets or receptors that may be affected by known releases or the potential future releases previously identified. The pathways from the release or potential releases also are described for each of the following media types.

5.1 HUMAN RECEPTORS

5.1.1 Groundwater

Potential sources of groundwater contamination at Vint Hill Farms Station (VHFS) include the following:

- Petroleum-based fuels from active or inactive underground storage tanks (USTs)
- Metals and solvents from the unlined photographic neutralization pit
- Cyanide wastes and metals from the inactive photographic wastewater lagoon
- Inadequate isolation of leachate from possible disposal areas that may contain municipal waste, construction debris, compositing materials, or unknown materials.

Human receptors that may be affected by known releases or potential future releases to groundwater include residents and workers at VHFS and on adjacent properties. Approximately 20,000 people use the groundwater drawn from wells within 4 miles of VHFS (Weston 1992). These people could be exposed to contaminants in the groundwater through ingestion (drinking the water), dermal contact, and inhalation (as a result of washing and bathing).

If land use of the property should change in the future (i.e., as a result of property transfer), and groundwater contamination was still present, any use of the groundwater also would render these users as potential receptors.

5.1.2 Surface Water

Possible sources of surface water contamination include the following:

- Possible metals contamination from runoff from former sludge piles and impact areas
- Operational problems associated with the sewage treatment plant resulting in potential cyanide and metals releases of untreated photographic wastewaters
- Spills of petroleum-based fuels and solvents from maintenance areas
- Cyanide wastes and metals from the inactive photographic wastewater lagoon
- Possible metals-contaminated leachates discharging from the incinerator absorption field.

Human receptors that may be exposed to contaminants as a result of releases to surface water include those who use the surface water for drinking, recreational purposes (e.g., swimming, wading), and eat food that has been affected by contaminated surface water. Receptors may be exposed to contaminants in surface water through ingestion and dermal contact.

Lake Manassas is approximately 1½ miles downstream from VHFS and is used as a drinking water supply for an estimated 152,000 people. The surface water intake on the east bank of Lake Manassas is approximately 3½ miles downstream of VHFS. Recreational areas within 15 miles downstream from VHFS include the Brentsville Historic Recreational Area on Broad Run (serving approximately 240,000 people per year), Camp Glenkirk on Lake Manassas, and the Lake Manassas Marina (a public park) (Weston 1990). In addition, other areas along South Run, Broad Run, and Kettle Run might be used as potential recreation areas. Food that might be affected by contaminated surface water includes fish that were caught in contaminated surface water, food grown on land where surface water was used as irrigation, and animals that feed on food grown on land where surface water was used as irrigation.

5.1.3 Soil

Potential sources of soil contamination include the following:

- Possible metals contamination from releases of untreated wastewater
- Metals and solvents from the unlined photographic neutralization pit
- Releases of petroleum-based fuels from active or inactive USTs, associated distribution lines, and spills at maintenance areas
- Inadequate isolation of leachate from possible disposal areas that may contain municipal waste, construction debris, compositing materials, or unknown materials
- Possible metals contamination from former sludge piles and impact areas
- Possible metals and PCB contamination associated with storage, handling, and disposal areas.

Potential receptors affected by releases to soils include residents on the facility (e.g., children playing in fields or around buildings where contamination is suspect) and workers on the facility (e.g., grounds maintenance workers or shop workers who have potential contact with contaminated soils). VHFS supports a population of approximately 3,900 people (Chesapeake 1991). In addition, contractors or construction workers brought in to perform temporary jobs that involve contact with contaminated soils are also potential receptors.

Receptors may be exposed to contaminants in soils through inadvertent ingestion, dermal contact, and inhalation of suspended soil particulates. As most of the contaminants released to soils are fuels, waste oils, or metals, volatilization of contaminants in the soils is most likely not a pathway of concern. If future use of the land should change and soils were not remediated, anyone having access to the contaminated soils would become a potential future receptor.

5.1.4 Air

Possible sources of releases to the atmosphere include the following:

- Open burning of municipal waste during operational periods of disposal areas
- Occasional releases of volatile organics from photographic operations, painting, and metal etching operations

- Releases of lead dust from impact areas
- Open burning of fire-fighting and petroleum-based materials during operating period of the fire training pit
- Disposal of automobile repair materials containing asbestos.

For the air pathway, potential receptors include residents and workers on the facility and on the adjacent properties, and contractors or construction workers brought in to perform special jobs. The station serves as a base of operations for approximately 500 military personnel and employs approximately 1500 civilians. Census data indicate that the population within 4 miles of the facility is approximately 7,000 people (Weston 1990). Receptors may be exposed to contamination through inhalation. Contaminants of particular concern on the facility are asbestos and lead-based paint, which are present in both residences and other buildings.

5.2 ENVIRONMENTAL RECEPTORS

VHFS is located on 701 acres of gently rolling hills, 210 acres of which are improved and 491 of which are unimproved. Approximately 94 acres of the unimproved grounds are hardwood forest (Chesapeake 1991). The forests are deciduous with some scattered pines. Forested areas are found mainly on the southeastern and western portions of the facility. The facility contains no open water areas (e.g., ponds and lakes), although numerous farm ponds and manmade lakes are located in the vicinity of VHFS. The western tributary of South Run (an intermittent stream) is considered a forested palustrine wetland, and there are approximately 20 acres of wetlands within 4 miles of VHFS. Approximately 5 acres of the property are within the 100-year floodplain of South Run, including Dump #1 and the Pistol Range (Figure 2-2). Most of the facility consists of open grassland, which is periodically mowed.

The wildlife at VHFS is mostly grassland species and species common to rural areas. These species include squirrels, cottontails, woodchucks, numerous rat and mouse species, robins, red-winged blackbirds, bobwhites, pheasants, mockingbirds, wood thrushes, and several species of swallows and sparrows. No threatened or endangered plant or wildlife species have been observed at VHFS. However, at Lake Manassas, the southern bald eagle (*Haliaeetus leucocephalus*), an endangered species in Virginia, is occasionally observed (ESE 1986). With

the exception of the birds, little migration of wildlife on or off of the facility occurs because the facility is entirely surrounded by a fence. Wildlife on the facility would be exposed to contaminants primarily in soils and air. Wildlife in the vicinity of VHFS also would be exposed to contaminants in the surface water.

The nearest stream, South Run, flows outside but near (within 50 to 300 feet) the northwestern and northern boundary of VHFS (see Figure 2-2). There is sufficient water in the runs and pools of South Run to support small populations of algae, benthic macroinvertebrates such as chironomids, stoneflies, snails and planaria, and fish such as minnows and sunfish. These instream individuals and populations could be affected by influents including any leaching from Dump #1 and the Pistol Range. The western South Run tributary runs along a northeastern axis, is about 3,600 feet in length, and drains 167 acres of the total 701 acres of VHFS. Organisms living in or drinking from this tributary could be exposed to possible contaminants that may have moved from the Sludge Disposal Area, Former Photographic Wastewater Lagoon, and EPIC industrial sewerline.

Despite the ephemeral or very low flow nature of the tributaries draining and criss-crossing VHFS, there is sufficient soil/sediment moisture at the confluence and other parts of the western tributary with South Run for it to be considered a forested palustrine wetland. The following animals are found in such habitats: frogs, toads, salamanders, small mammals and birds, snails, and crayfish. When there is running water in and near the tributaries, both aquatic and wetland animals will move up the tributary. Fish such as minnows, water striders, and other organisms will leave South Run and swim upstream where they may be stranded as the tributaries dry up or simply lose water to the subsurface, as is the case in the middle of the western tributary.

A limited amount of information is available on environmental receptors at VHFS. A more indepth survey at VHFS is recommended.

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6. ENHANCED PRELIMINARY ASSESSMENT FINDINGS AND CONCLUSIONS

6.1 SUMMARY OF ENPA FINDINGS

Vint Hill Farms Station (VHFS) is a 701-acre site located in Fauquier County, Virginia, approximately 30 miles west of Washington, DC. The facility is used by various Army and U.S. Department of Defense (DOD) agencies to research, develop, produce, and sustain new signals warfare technology for military intelligence. The environmentally significant operations associated with the property are photographic processing, vehicle maintenance, electronic equipment refurbishing, metal etching, sandblasting, and painting.

The surrounding properties were inspected by an automobile survey and a visual inspection through the boundary fence. No walking inspections were performed on surrounding properties because no potential offsite sources were identified as a result of the automobile survey and visual inspections through the fence. The closest potential source of contamination is Mayhugh's Gas Station, which is located 1 mile east of VHFS on Route 215. The gas station has recently upgraded its USTs to conform to Federal standards and there were no records identified during the search of Virginia SWCB files to indicate spills or leaks from the USTs. In addition, the facility is located downgradient from VHFS. For these reasons, the potential for contaminant migration onto VHFS from this site is not probable.

All properties within a 2-mile radius of VHFS were investigated through a search of Federal and state data bases for actual and potential Superfund sites; hazardous waste generators; hazardous waste treatment, storage, and disposal facilities; petroleum and hazardous substance spills; activities and leaking USTs; and solid waste landfills and incinerators. The results of the search are shown in Appendix E. No offsite sources were identified within a 2-mile radius of VHFS.

6.2 RECOMMENDATIONS FOR FURTHER ACTION

The primary objective of the enhanced preliminary assessment (ENPA) is to identify and evaluate areas requiring environmental evaluation (AREEs) that would result in one of three actions: 1) immediate action, 2) site investigation, or 3) no additional investigation or action.

A recommendation for immediate action is made when the AREEs are considered to represent imminent or immediate substantial threat to human health or the environment. A site investigation will be recommended when the complete assessment of these AREEs and the impact or potential impact they have on human health and/or the surrounding environment is not possible based on the information made available at the time of the ENPA. A property will be recommended for no additional action if no wastes or materials of concern are present at the property or no known or suspected release events have occurred in the past.

The 42 facilities of concern are shown in Table 6-1 along with the recommendations for further action and their rationale. A total of 29 AREEs were recommended for site investigation activities while 10 AREEs require no further action. Three of the AREEs (i.e., IMMC Neutralization Pit, Auto Craft Shop UST, and AAFES Service Station USTs) are currently undergoing site characterizations or corrective action; therefore, no recommendations were made for these AREEs. No AREEs were found to require immediate action.

Table 6-1. Recommendations for Further Action

AREE	Facility	Recommendation	Rationale
1	Dump #1	Site Investigation	Continuing hazard of leachate containing hazardous contaminants entering groundwater and South Run.
2	Sewage Treatment Plant	Site Investigation	Possible residual contamination from sludge piles may be entering South Run.
3	Warehouse	Site Investigation	Site is being investigated at the request of VDEQ.
4	Auto Craft Shop	Site Investigation	Continuing hazard of spills of solvent, oils, antifreeze, and gasoline reaching the surrounding soils.
5	EPIC Building	Site Investigation	Possible photographic wastewater sludges within EPIC sewerline may be entering the surrounding soils and groundwater.
6	Health Clinic	No Further Action	No evidence of releases of medical wastes or radioactive materials to the surrounding environment.
7	Electrical Equipment Facility	Site Investigation	Possible leaks of metal etching wastes from the pretreatment tank to the surrounding soils.
8	IMMC Neutralization Pit	Under Investigation	Documented soil and groundwater contamination in area.
9	Vehicle Maintenance Area	Site Investigation	Continuing hazard of spills of gasoline, waste oil, antifreeze, and solvent reaching the South Run tributary through the storm sewer.
10	Former Photographic Wastewater Lagoon	Site Investigation	Possible residual contamination from storage of photographic wastewaters may be impacting the surrounding soils and groundwater.
11	Former Sewage Treatment Plant	Site Investigation	Possible residual contamination from former sludge piles may be entering the South Run tributary.
12	Dump #2	Site Investigation	Site is being investigated at the request of VDEQ.
13	Sludge Disposal Area	Site Investigation	Possible residual contamination from sewage sludge, filter sand, and sandblasting wastes may be impacting the surrounding soils.
14	Skeet Range	Site Investigation	Lead from shotgun pellets may have contaminated subsurface soils.
15	Hazardous Waste Storage Building	No Further Action	No evidence of releases of hazardous materials or wastes to the surrounding environment.
16	Firefighter Training Pit	Site Investigation	Probable petroleum contamination in soils beneath the unlined pit.
17	Dump #3	Site Investigation	Evidence of noncompostable materials disposed in area. Possible sandblasting wastes disposed in area.

Table 6-1. Recommendations for Further Action (continued)

AREE	Facility	Recommendation	Rationale
18	Grease Pit	Site Investigation	Possible automotive waste oils disposed of in unlined pit.
19	Pistol Range	Site Investigation	Lead from bullets may have contaminated subsurface soils and stormwater runoff.
20	Incinerator	Site Investigation	Floor drains may have carried hazardous wastes to the septic system.
21	Sand Filter Beds	Site Investigation	Possible ash leachate beneath unlined sand filter beds and within leach field.
22	Fixed Ammunition Magazine	No Further Action	No evidence of storage of hazardous materials.
23	Transformers	No Further Action	All transformer cooling oils are below 500 ppm PCBs. New transformer survey is in progress.
24	Transformer Storage Area	Site Investigation	Site is being investigated at the request of VDEQ.
25	Sugar Tree	Site Investigation	Site is being investigated at the request of VDEQ.
26	Outdoor Wash Racks	Site Investigation	Grit chamber has petroleum and antifreeze contamination. Surrounding soils may be contaminated from overflows.
27	AAFES Service Station	Site Investigation	Continuing hazard of spills of gasoline, waste oil, antifreeze, and solvent reaching the surrounding soils.
28-1	Auto Craft Shop UST	Under Investigation	Documented soil and groundwater contamination in area.
28-2	Vehicle Maintenance Area USTs	No Further Action	All three tanks have passed vacuum pressure leak testing.
28-3	AAFES Service Station USTs	Under Investigation	Documented soil and groundwater contamination.
28-4	Former Steam Plant USTs	No Further Action	Closure Report submitted to SWCB in December 1990. Confirmatory soil samples taken beneath the removed tanks did not detect TPH above 16 ppm.
28-5	Former Service Station Abandoned USTs	Site Investigation	Potential residual contamination from leaks of the old steel tanks to surrounding soils.
28-6	IEWD Emergency Generator USTs	No Further Action	The four tanks have passed vacuum pressure leak testing
28-7	Engineering Compound USTs	No Further Action	The two tanks have passed vacuum pressure leak testing.
28-8	Power Plant UST	No Further Action	The tank has passed vacuum pressure leak testing.

Table 6-1. Recommendations for Further Action (continued)

AREE	Facility	Recommendation	Rationale
28-9	STP Emergency Generator USTs	No Further Action	The two tanks have passed vacuum pressure leak testing.
29-1	Salvage Yard	Site Investigation	Site is being investigated at the request of VDEQ.
29-2	Possible Sludge Disposal Area	Site Investigation	Evidence of sewage sludge disposal with other unknown materials.
29-3	Possible Disposal Area	Site Investigation	Site is being investigated at the request of VDEQ.
29-4	Disposal Area	Site Investigation	Evidence of construction debris disposal with other unknown materials.
29-5	Liquid Impoundment Area	Site Investigation	Site is being investigated at the request of VDEQ.
29-6	Possible Burn Pile	Site Investigation	Site is being investigated at the request of VDEQ.

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APPENDIX A: INTERVIEW INFORMATION

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APPENDIX A: INTERVIEW INFORMATION

INDIVIDUALS INTERVIEWED

Richard Reisch, Environmental Engineer
Directorate of Engineering and Logistics

Mark Libby, Chief, Facilities Operation and Maintenance Division
Directorate of Engineering and Logistics

Bill Hitt, Chief, Fire Department/HazMat Response Team
VHFS Emergency Services

Steve O'Neill
Former Employee

Dave Joiner, Dyncorp Manager
Sewage Treatment Plant

Wally Corcoran, Hazardous Materials Manager
Intelligence Materials Management Center

Helen Warsinsky, Manager
AAFES Service Station

Sergeant Chong
Medical Center

James Rylander, Manager
PCR Warehouse

Bob Acree, Utilities Manager
Integrated Electronics Warfare Department

Tom Osburg, Manager
EPIC Operation

Ernie Stone, Technician
EPIC Operation

Louis Hilder
Virginia State Water Control Board, UST Division

Greg Clayton, Region IV Director
Virginia Air Pollution Control Department

John Largent, Supervisor
Fauquier County Environmental Health Department

Chuck Thompson, Fire Chief
Fauquier County Emergency Services

Stacy Morekas
U.S. EPA Region III, Superfund Compliance Division

Michelle Monte
Virginia Department of Environmental Quality, Hazardous Waste Division

INVESTIGATORS

Al Wickline
Program Manager

Connie Samson
Project Manager

Nand Kaushik, P.E.
Senior Engineer

John Whelpley, E.I.T.
Environmental Engineer

Lisa Jones-Bateman
Environmental Scientist

Wayne Stoner
Geologist

Linda Meredith
Toxicologist

APPENDIX B: SUPPLEMENTAL GEOLOGICAL MAPS

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PHYSIOGRAPHY at VHFS

SOURCE: ESE 1986

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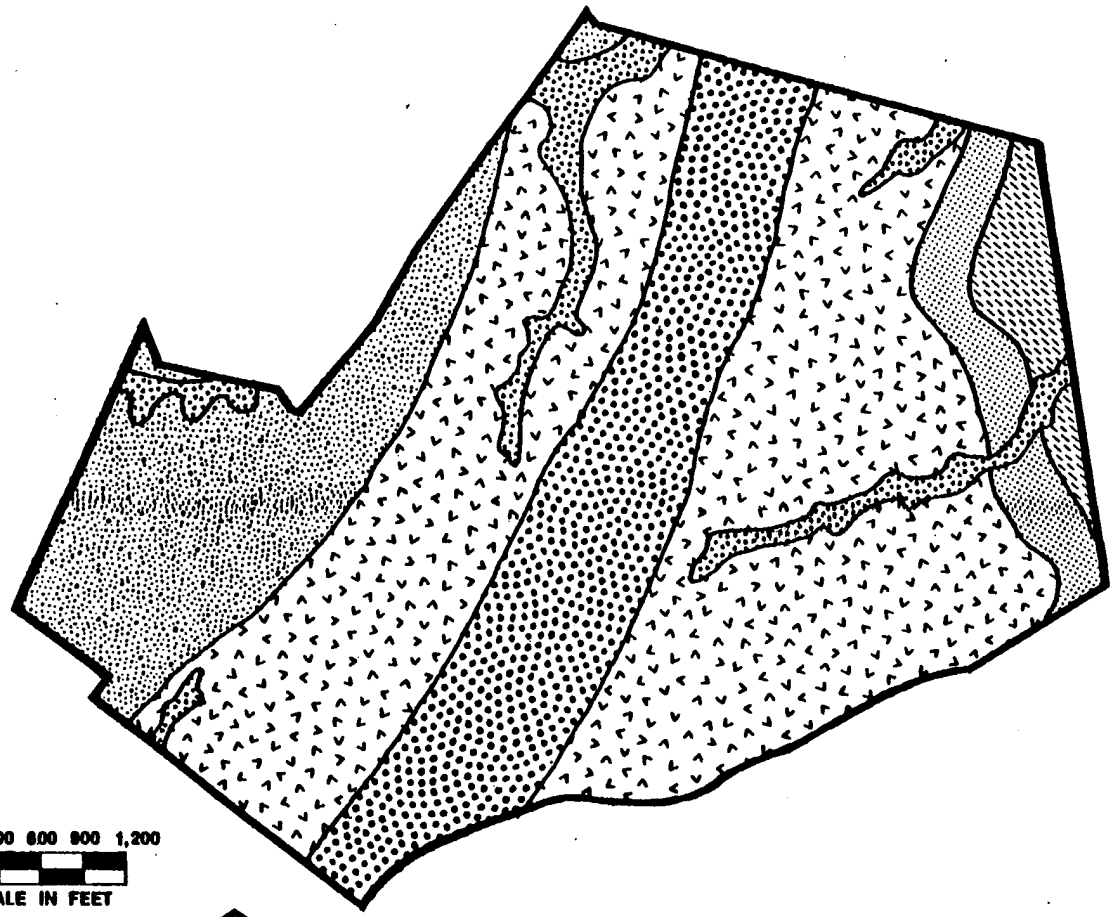

KEY

- QUATERNARY ALLUVIUM (Qal)
- JURASSIC/TRIASSIC CATHARPIN CREEK MEMBER (JTrbc)
- JURASSIC/TRIASSIC SANDER BASALT (JTrbcs)
- JURASSIC/TRIASSIC HICKORY GROVE BASALT (JTrbch)
- JURASSIC/TRIASSIC DIABASE (JTrd)
- JURASSIC/TRIASSIC HYDRO-THERMALLY ALTERED (JTrlm)

NOTE: REFER TO TABLE 5.1-1 FOR DESCRIPTION OF THE ABOVE

SOURCE: Lee, 1979 and 1980.

VINT HILL 12/04/85

Figure 5.1-1
GEOLOGIC MAP OF VHFS BASED ON HISTORICAL DATA

ENVIRONMENTAL CONTAMINATION SURVEY
Vint Hill Farms Station
Warrenton, Virginia

U.S. Army
Toxic and Hazardous Materials Agency
Aberdeen Proving Ground, Maryland

Table 5.1-1. Geologic Units on VHFS Based on Historical Data

Geologic Nomenclature			Lithologic Description
Sedimentary/Igneous Rocks			
Qal	Quarternary Alluvium		Gravel, sand, silt, and clay which have been transported by fluvial processes and deposited in stream valleys.
JTrbc	Jurassic/Triassic Catharpin Creek Member	Culpeper Group Bull Run Formation	Sandstone and siltstone, with minor units of conglomerate, shale, and impure limestone. Partially interlayered with basalt flows. Estimated from 40 to 5,150 m thick.
JTrbcs	Jurassic/Triassic Sander Basalt		Basalt flows interlayered with sandstone and siltstone of the Catharpin Creek Member. Estimated to be as thick as 345 m.
JTrbch	Jurassic/Triassic Hickory Grove Basalt		Very fine to very coarse-grained basalt. Estimated to be as thick as 210 m.
JTrd	Jurassic/Triassic Undifferentiated Diabase		Augite, pigeonite, labradorite, and ilmenite, ranging from aphanitic to coarse-grained. Locally pegmatitic.
Metamorphosed Rocks			
JTrm	Jurassic/Triassic Undifferentiated Hydrothermally Altered Rock		Altered sandstones, siltstones, and shale. Hornfels is the dominant rock type; with fused lenses, bands, and irregular masses of granulite and quartzite.

NOTE: Refer to Fig. 5.1-2 for locations of the above on VHFS.

Source: Lee, 1979.

SOILS at VHFS

SOURCE: ESE 1986

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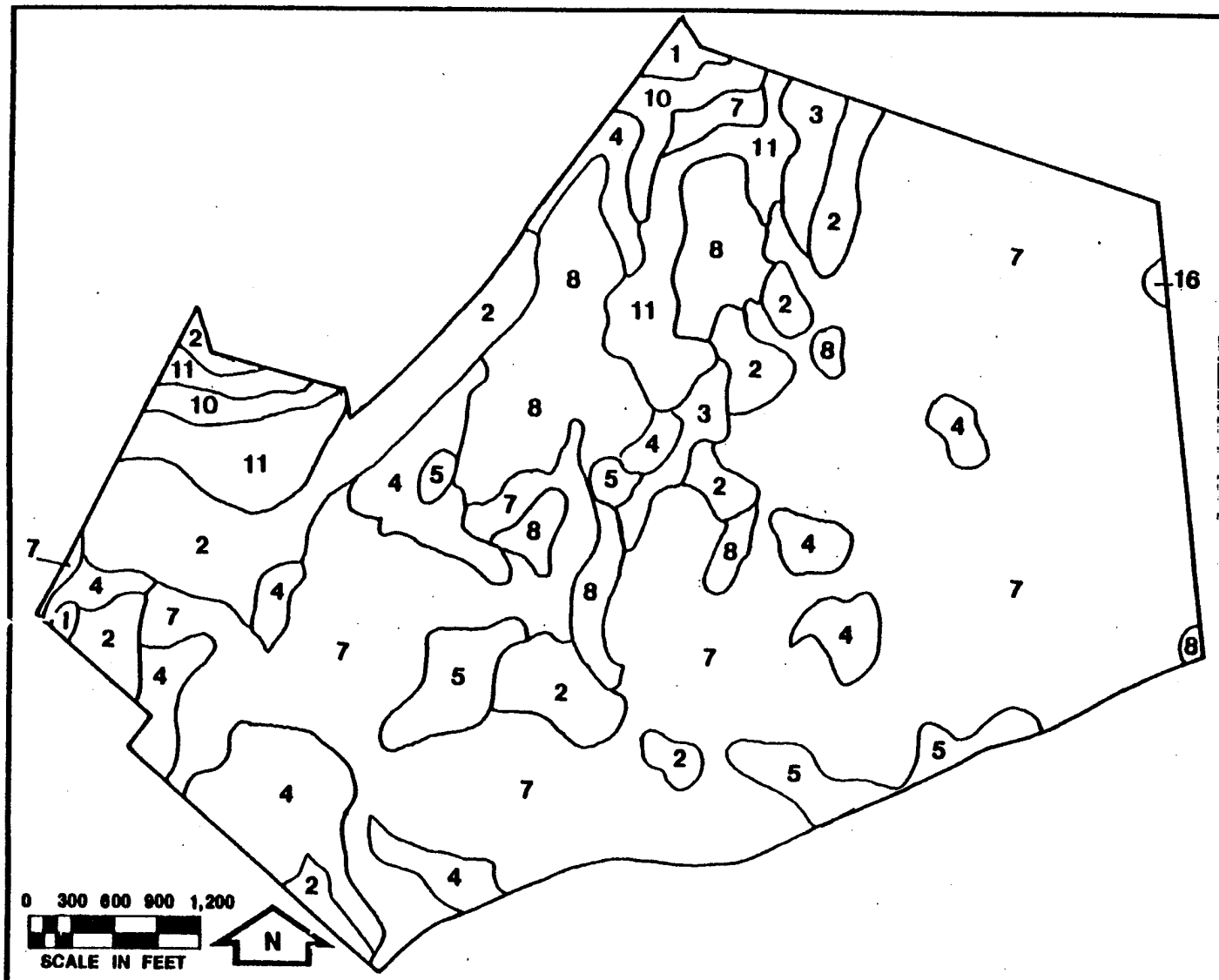

SOURCE: U.S. Soil Conservation Service, 1966.

VINT HILL 120485

Figure 5.1-4 **DISTRIBUTION OF SOIL MANAGEMENT GROUPS ON VHFS**	**ENVIRONMENTAL CONTAMINATION SURVEY** **Vint Hill Farms Station** **Warrenton, Virginia**	**U.S. Army** **Toxic and Hazardous Materials Agency** **Aberdeen Proving Ground, Maryland**

Table 5.1-2. Physical Properties of Soils on VHFS

Management Group	Relative Permeability	Internal Drainage	Runoff	Slope (Percent)
1	Moderate	Well to moderately well but subject to periodic flooding	—	2 to 7
2	Moderate	Well drained	Medium	2 to 7
3	Moderate	Well to somewhat excessively well drained	Medium to high	7 to 14
4	Moderate but with poorly permeable subsoil	Well to moderately well drained	Medium	2 to 7
5	Moderate	Well to moderately well drained	Medium to high	7 to 14
7	Fairly permeable when dry but has poorly permeable subsoil	Imperfectly or poorly drained	Slow to very slow	0 to 7
8	Moderate	Well to excessively well drained	Medium	2 to 7
10	Upper horizon moderate; lower horizon slow	Imperfectly to poorly drained	—	0 to 2
11	Moderate with poorly permeable subsoil	Well to excessively well drained	Medium to rapid	7 to 14
16	Poorly permeable subsoil	Imperfectly to very poorly drained	Slow to very slow	2 to 25

— = Not reported

Source: USSCS, 1966.

APPENDIX C: VHFS BUILDINGS WITH ASBESTOS

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PHASE II
COMPREHENSIVE ASBESTOS ASSESSMENT SURVEY
UNITED STATES ARMY COMMUNICATIONS-ELECTRONICS ACTIVITY
VINT HILL FARMS STATION
WARRENTON, VIRGINIA

FINAL REPORT

Submitted to:

Directorate of Engineering and Housing
Vint Hill Farms Station

Under:

Baltimore District Corps of Engineers
Contract No. DAC 31-88-0024, Task No. 1A00020-8J
with
Einhorn, Yaffee and Prescott

Prepared by:

M. Dunn, P. Horton, and D. Travagline
Ching K. Chen, Ph.D., P.E., C.I.H., Project Manager

Submitted by:

Technology Services Company
A Division of Science Applications International Corporation
McLean, Virginia

December 21, 1990

TABLE 4-1
Summary Data on Types of ACM Found

Building No.	No ACM	ACM				
		Pipe Insulation	Duct Cover	Sheet vinyl, floor tile, and Mastic	Transite	Miscellaneous**
135	X					
142	X					
145	X					
151				X		
152	X					
153	X					
201				X		
203				X		
204	X					
213	X					
216	X					
217	X					
218				X		
219		X		X		X
224	X					
227				X	X	
228				X *		
229		X		X		
230				X		
231				X *		
232					X	
233					X	
234	X					
243	X					
245	X					
250						X
251		X		X	X	
252				X *		
253	X					
254	X					
256			X	X	X	
257				X *		
258				X *		
259	X					
266	X					
269	X					
280	X					
282				X		X
283				X		
284	X					
285	X					
289	X					

TABLE 4-1 (Continued)
Summary Data on the Types of ACM Found

Building No.	No ACM	ACM				
		Pipe Insulation	Duct Cover	Sheet vinyl, Floor tile, and Mastic	Transite	Miscellaneous**
291	X					
295	X					
299	X			-		
307					X	
313				X *		
315				X *		
320	X					
321	X					
329	X					
330				X		
331				X		
391	X					
392	X					
393	X					
395	X					
410					X	
411				X		
412				X		
413				X		X
414				X		
415				X		X
416				X		
417				X		X
418				X		
419				X		X
420		X		X	X	
421		X		X	X	
422		X		X	X	
423		X		X	X	
424	X					
425		X		X	X	
426				X		
426MR	X					
427				X		
427MR	X					
428				X		
428MR	X					
429				X		X
429MR	X					
431				X		X
432				X		X
433				X		X

Building No.	No ACM	ACM				
		Pipe Insulation	Duct Cover	Sheet vinyl, Floor tile, and Mastic	Transite	Miscellaneous**
434				X	*	X
435				X		X
436				X		X
437				X		X
438				X		X
439				X		X
440				X		X
441				X		X
442				X		X
443				X		X
444				X		X
445	X					
446	X					
447	X					
448	X					
449	X					
450	X					
451	X					
452	X					
453	X					
454	X					
501	X					
503	X					
600				X		X
601				X		X
602				X		X
603				X		X
604				X		X
605				X		X
606				X		X
607				X		X
608				X		X
609				X		X
610				X		X
611				X		X
612				X		X
613				X		X
614				X		X
615				X		X

* Floor covering not inspected due to existing carpet, vinyl asbestos tile assumed to be present.

**Miscellaneous materials include contaminated crawlspaces (Buildings 219 and 250), gaskets on incinerator doors (Building 282), and asbestos paper in light fixtures in other listed buildings.

APPENDIX D: SUPPLEMENTAL SAMPLING DATA

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GROUNDWATER SAMPLING DATA

SOURCE: ESE 1986

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VINT HILL 10/11/85

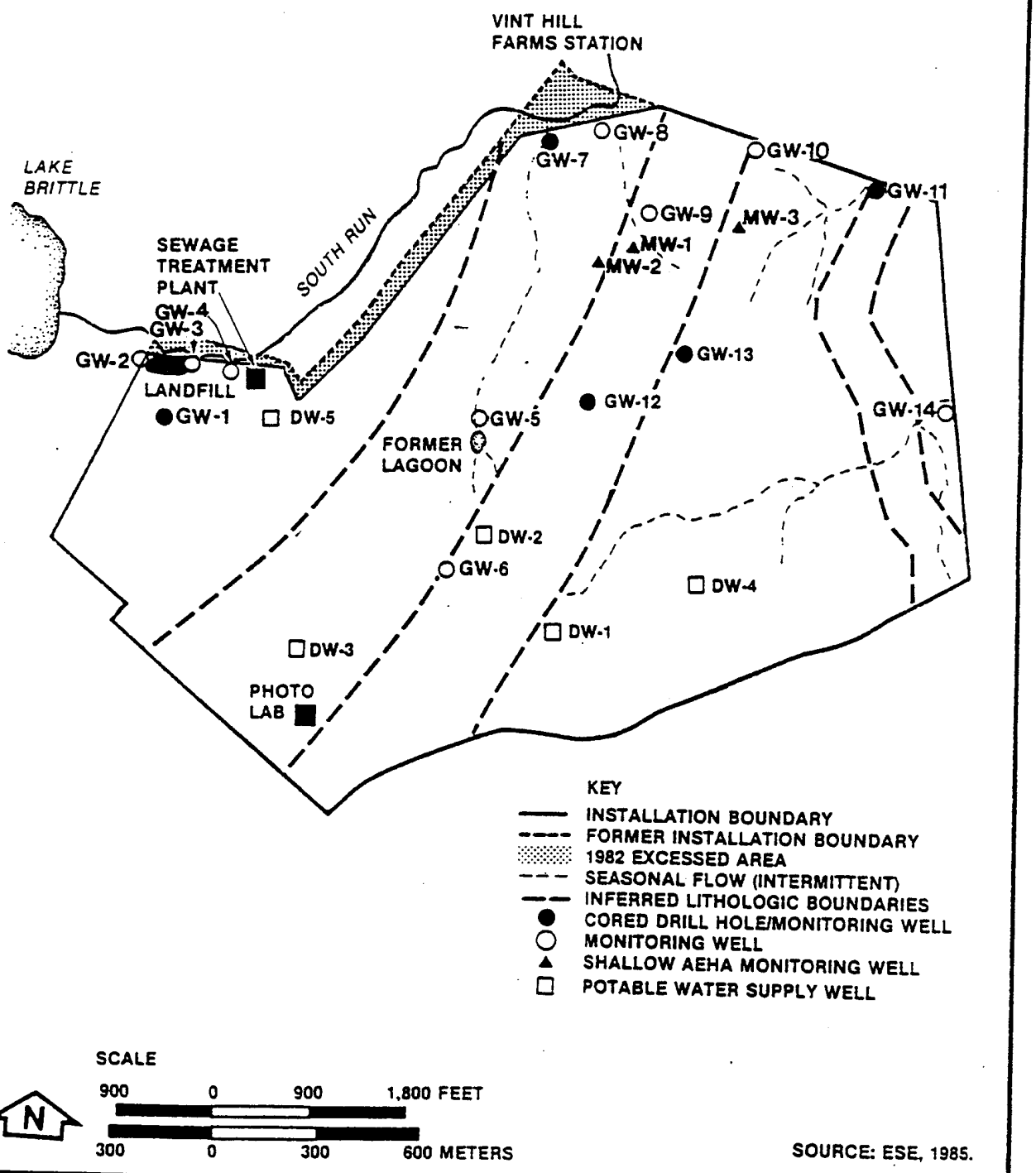

Figure 3.2-1
MONITOR WELL LOCATIONS
AT VHFS

ENVIRONMENTAL
CONTAMINATION SURVEY
Vint Hill Farms Station
Warrenton, Virginia

U.S. Army
Toxic and Hazardous Materials Agency
Aberdeen Proving Ground, Maryland

Table 2.4-2. Ground Water Quality Data for the Three Monitoring Wells and Four of the Drinking Water Wells on VHFS (Feb. 2-3, 1981)

	Monitor Wells			Drinking Water Wells				Virginia Ground Water Standard
	MW1	MW2	MW3	DW001	DW003	DW004	DW005	
pH	8.1	7.4	7.3					5.5-8.5
Conductivity	302	495	387					
Alkalinity (as $CaCO_3$)	88	236	161					
Hardness	100	299	208					
Ammonia-Nitrogen (NH_3-N)	0.82	0.08	0.22					0.025
Nitrate-Nitrogen (NO_3-N)	0.65	0.01	1.9					5.0
Nitrogen Dioxide-Nitrogen (NO_2-N)	ND	ND	ND					0.025
Chloride (Cl)	6.1	4.4	30.0					
Phenols	0.11	0.67	2.7					0.001
Total Organic Carbon (TOC)	22	2.5	2.8					
Cyanide (CN)	0.09	0.03	0.05					0.005
Lead (Pb)	0.007	ND	ND	ND	0.007	ND	ND	0.05
Zinc (Zn)	0.026	0.048	0.051	0.015	0.113	0.031	0.023	0.05
Cadmium (Cd)	0.011	ND	ND	ND	ND	ND	ND	0.0004
Arsenic (As)	ND	ND	ND	ND	0.013	ND	ND	0.05
Mercury (Hg)	ND	ND	ND	ND	ND	ND	ND	0.00005
Barium (Ba)	ND	ND	ND					1.0
Chromium (Cr)	ND	ND	ND					0.05
Calcium (Ca)	0.050	ND	ND					1.0
Selenium (Se)	ND	ND	ND					0.01
Silver (Ag)	ND	ND	ND					0

Note: All values are expressed in mg/L, except pH (pH units) and conductivity (umhos/cm).

ND = Not detected.
$CaCO_3$ = Calcium carbonate.

Source: USAEHA, 1981.
ESE, 1981.

Table 6.1-1. Summary of Exploratory Survey Ground Water Quality at VHFS—Aug. 1 and 2, 1984

Well (see Fig. 6.1-2)	Concentration (ug/L) of: Free CN	Total CN	Phenols	Concentration (ug/L) of Dissolved Metals Cd	Cr	Pb	Hg	Ag	Concentration (ug/L) of Volatile or Extractable Organics* MeCl	Dioctyl Phthalate	Bis(2-Ethyl Hexyl) Phthalate
Upgradient Reference Well											
GW01W	<4.5	<4.0	<6	<2.9	<5.0	<13.7	0.3	<8.0	<1	10	<20
Landfill Area											
GW02W	<4.5	<4.0	<6	<2.9	<5.0	<13.7	0.3	<8.0	5	20	<20
GW03W	<4.5	<4.0	<6	<2.9	<5.0	16.2	<0.2	<8.0	<1	70	60
GW04W	<4.5	<4.0	<6	<2.9	<5.0	<13.7	0.5	<8.0	<1	30	<20
Former Lagoon Area											
GW05W	<4.5	<4.0	<6	<2.9	<5.0	15.2	<0.2	<8.0	N/A	N/A	N/A
EPIC Sewerline											
GW06W	<4.5	<4.0	<6	<2.9	<5.0	<13.7	0.3	<8.0	N/A	N/A	N/A
Downgradient Wells (lagoon and sludge disposal areas)											
GW07W	<4.5	<4.0	<6	<2.9	<5.0	<13.7	0.5	<8.0	<1	20	<20
GW08W	<4.5	<4.0	<6	<2.9	<5.0	<13.7	<0.2	<8.0	N/A	N/A	N/A
GW09W	<4.5	<4.0	<6	<2.9	<5.0	22.3	<0.2	<8.0	<1	<10	<20
Sludge Disposal Area											
MW1	<4.5	<4.0	<6	<2.9	<5.0	<13.7	<0.2	<8.0	N/A	N/A	N/A
MW2	<4.5	<4.0	<6	<2.9	<5.0	<13.7	0.2	<8.0	N/A	N/A	N/A
MW3	<4.5	<4.0	<6	<2.9	<5.0	<13.7	<0.2	<8.0	N/A	N/A	N/A
Exploratory Wells											
GW10W	<4.5	<4.0	<6	<2.9	<5.0	<13.7	<0.2	<8.0	N/A	N/A	N/A
GW11W	<4.5	<4.0	<6	<2.9	<5.0	<13.7	<0.2	<8.0	N/A	N/A	N/A
GW12W	<4.5	<4.0	<6	<2.9	<5.0	<13.7	<0.2	<8.0	<1	<10	<20
GW13W	<4.5	<4.0	<6	<2.9	<5.0	21.3	<0.2	<8.0	N/A	N/A	N/A
GW14W	<4.5	<4.0	<6	<2.9	<5.0	<13.7	<0.2	<8.0	6	<10	<20
Potable Supply Wells											
DW001	<4.5	<4.0	<6	<2.9	<5.0	<13.7	<0.2	<8.0	N/A	N/A	N/A
DW002	<4.5	<4.0	<6	<2.9	<5.0	<13.7	<0.2	<8.0	N/A	N/A	N/A
DW003	<4.5	<4.0	<6	<2.9	<5.0	<13.7	0.5	<8.0	N/A	N/A	N/A
DW004	<4.5	<4.0	<6	<2.9	<5.0	<13.7	<0.2	<8.0	<1	<10	<20
DW005	<4.5	<4.0	<6	<2.9	<5.0	<13.7	<0.2	<8.0	N/A	N/A	N/A

*No other volatile or extractable organics were detected in any samples by GC/MS. See App. E for the complete organic database.

Abbreviations: Ag = silver; Cd = cadmium; CN = cyanide; Cr = chromium; Hg = mercury; MeCl = methylene chloride; N/A = not analyzed; ug/L = micrograms per liter

Source: ESE, 1985.

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SURFACE WATER SAMPLING DATA

SOURCE: ESE 1986

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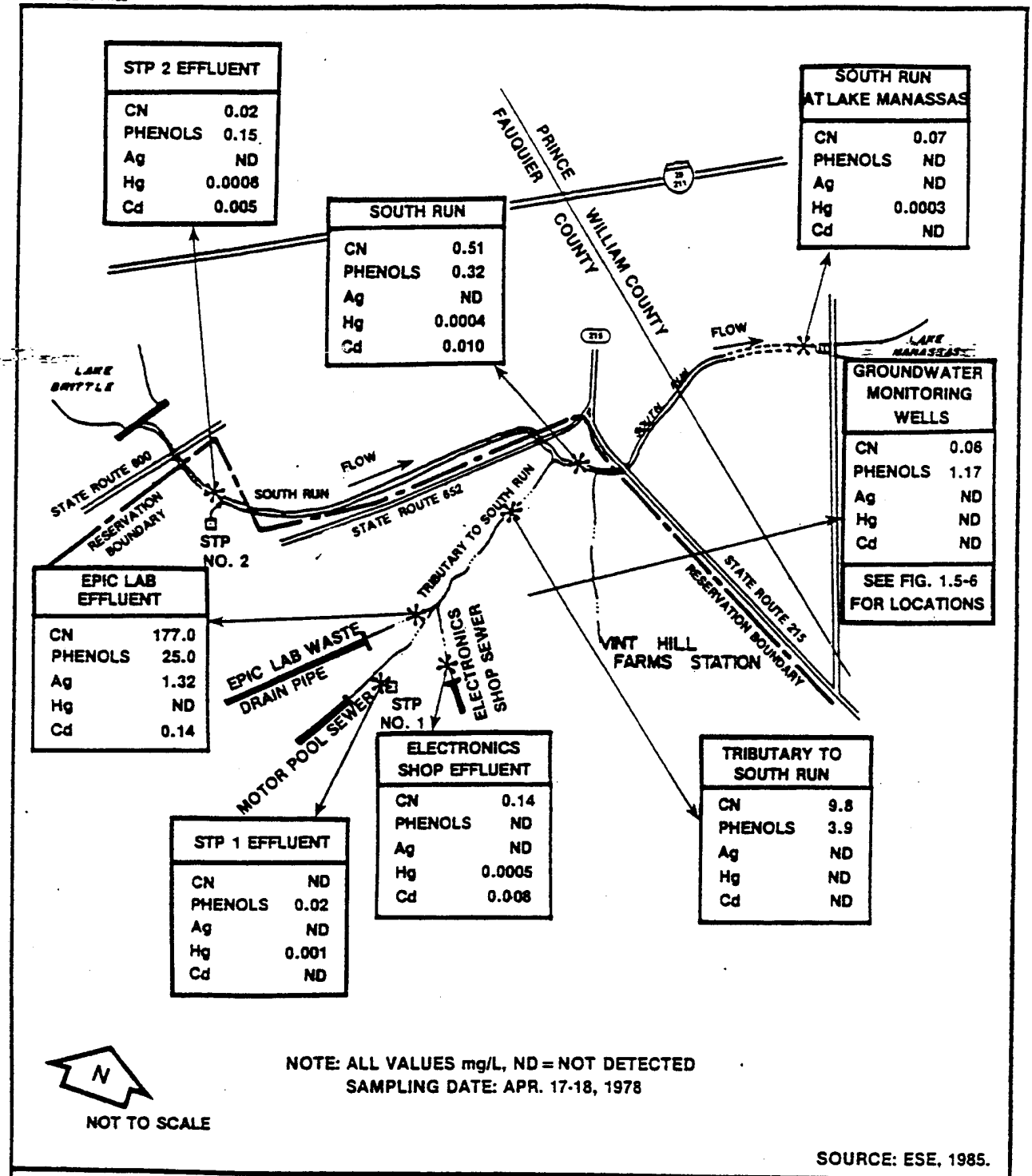
VINT HILL 10/11/85



NOTE: ALL VALUES mg/L, ND = NOT DETECTED
SAMPLING DATE: APR. 17-18, 1978

SOURCE: ESE, 1985.

Figure 2.4-1
SUMMARY OF SURFACE WATER QUALITY DATA FOR CN, PHENOLS, Ag, Hg, AND Cd FOR VHFS

ENVIRONMENTAL CONTAMINATION SURVEY
Vint Hill Farms Station
Warrenton, Virginia

U.S. Army
Toxic and Hazardous Materials Agency
Aberdeen Proving Ground, Maryland

Table 2.4-1. Water Quality Data for VHFS, Including Wastewater Effluents (Data are for Composite Samples Collected Apr. 17-18, 1978)

Parameter	STP 2 Effluent	Electronics Shop Effluent	Photographic Laboratory Effluent	STP 1 Effluent	Tributary Downstream from Electronics Shop, Photographic Laboratory, and STP 1	South Run Downstream of Confluence with Tributary	South Run at Lake Manassas	Criteria	
								EPA	State of Virginia (Class III)
pH	6.6	7.5	6.7	7.0	6.7	6.6	6.6		
Conductivity	750	700	2,620	790	775	225	198		
Oil and Grease	NA	NA	NA	NA	NA	NA	—		
BOD	NA	NA	NA	NA	NA	4	2		
COD	37	15	868	48	74	19	8		
TOC	58	21	584	45	65	19	19		
TS	580	444	2,060	565	519	264	249		
SO_4	224	136	129	36	241	147	60		
TP	9.6	0.07	1.6	12	5.0	0.73	0.67		
NH_3-N	1.1	0.46	75	2.1	4.2	0.41	ND		
NO_2+NO_3-N	19	0.36	10	7.3	3.7	2.4	1.6		
TKN	3.5	0.96	181	6.5	9.5	1.3	0.43		
CN	0.02	0.14	177	ND	9.8	0.51	0.07	0.005	0.005
Phenols	0.15	ND	25	0.02	3.9	0.32	ND	0.001	0.001
Al	ND	ND	<5.0	ND	ND	ND	ND		
Ag	ND	ND	1.32	ND	ND	ND	ND	0.050	0
Ca	32.7	39.0	33.3	33.0	29.0	19.4	19.0		
Cd	0.005	0.008	0.14	ND	ND	0.010	ND	0.0012	0.0012
Cr (Total)	ND	ND	<0.5	ND	ND	ND	ND	0.100	0.100
Cu	ND	ND	<0.5	ND	ND	ND	ND	see App. F	see App. F
Fe	0.14	0.18	12.8	0.2	1.23	0.43	0.16	1.0	1.
Hg	0.0006	0.0005*	ND	0.0010	ND	0.0004	0.0003	0.00005	0.00005

Table 2.4-1. Water Quality Data for VHFS, Including Wastewater Effluents (Data are for Composite Samples Collected Apr. 17-18, 1978) (Continued, Page 2 of 2)

Parameter	STP 2 Effluent	Electronics Shop Effluent	Photographic Laboratory Effluent	STP 1 Effluent	Tributary Downstream from Electronics Shop, Photographic Laboratory, and STP 1	South Run Downstream of Confluence with Tributary	South Run at Lake Manassas	Criteria† EPA	Criteria† State of Virginia (Class III)
Mg	7.7	8.5	31.9	7.6	7.5	6.3	6.1		
Mn	ND	0.203	<0.5	ND	0.288	0.099	ND	0.050	—
Ni	ND	ND	<2.0	ND	ND	ND	ND	see App. F	see App. F
Pb	ND	ND	<2.0	ND	ND	NA	ND	see App. F	see App. F
Zn	0.040	0.019	<0.3	0.038	ND	ND	ND	see App. F	see App. F
MBAS	0.96	0.08	0.09	0.92	0.32	0.10	0.06		
Flow	56,000	1,440	16,800	67,000	340,000	2.76×10^6	3.55×10^6		
Receiving Water: (Fig. 2.3-1)	South Run	Tributary of South Run	Tributary of South Run	Tributary of South Run	South Run	Lake Manassas	Lake Manassas		

* Note: The value for Hg given in Table 14 of USAEHA (1978c) should be 0.0005 mg/L. The value shown in Table 14 (8.5 mg/L) is the concentration for Mg (USAEHA, 1981).

† Appendix references refer to ESE, 1981.

ND = Not detected; NA = Not analyzed; — = Not reported.

All values expressed in mg/L except for pH (in pH units), conductivity (in umho/cm), and flow (in gallons/day).

Abbreviations:

Ag = Silver
Al = Aluminum
BOD = Biochemical Oxygen Demand
Ca = Calcium
Cd = Cadmium
CN = Cyanide
COD = Chemical Oxygen Demand
Cr = Chromium
Cu = Copper
Fe = Iron
gal/day = gallons per day
Hg = Mercury
MBAS = Methylene-Blue Active Substances
Mg = Magnesium
mg/L = milligrams per liter
Mn = Manganese
NH_3-N = Ammonia-Nitrogen
Ni = Nickel
NO_2+NO_3-N = Nitrite + Nitrate-Nitrogen
Pb = Lead
SO_4 = Sulfate
TKN = Total Kjeldahl Nitrogen
TOC = Total Organic Carbon
TP = Total Phosphorus
TS = Total Solids
umho/cm = micromhos per centimeter
Zn = Zinc

Source: Adapted from USAEHA, 1978c.
Modified from ESE, 1981.

VINT HILL 12/04/85

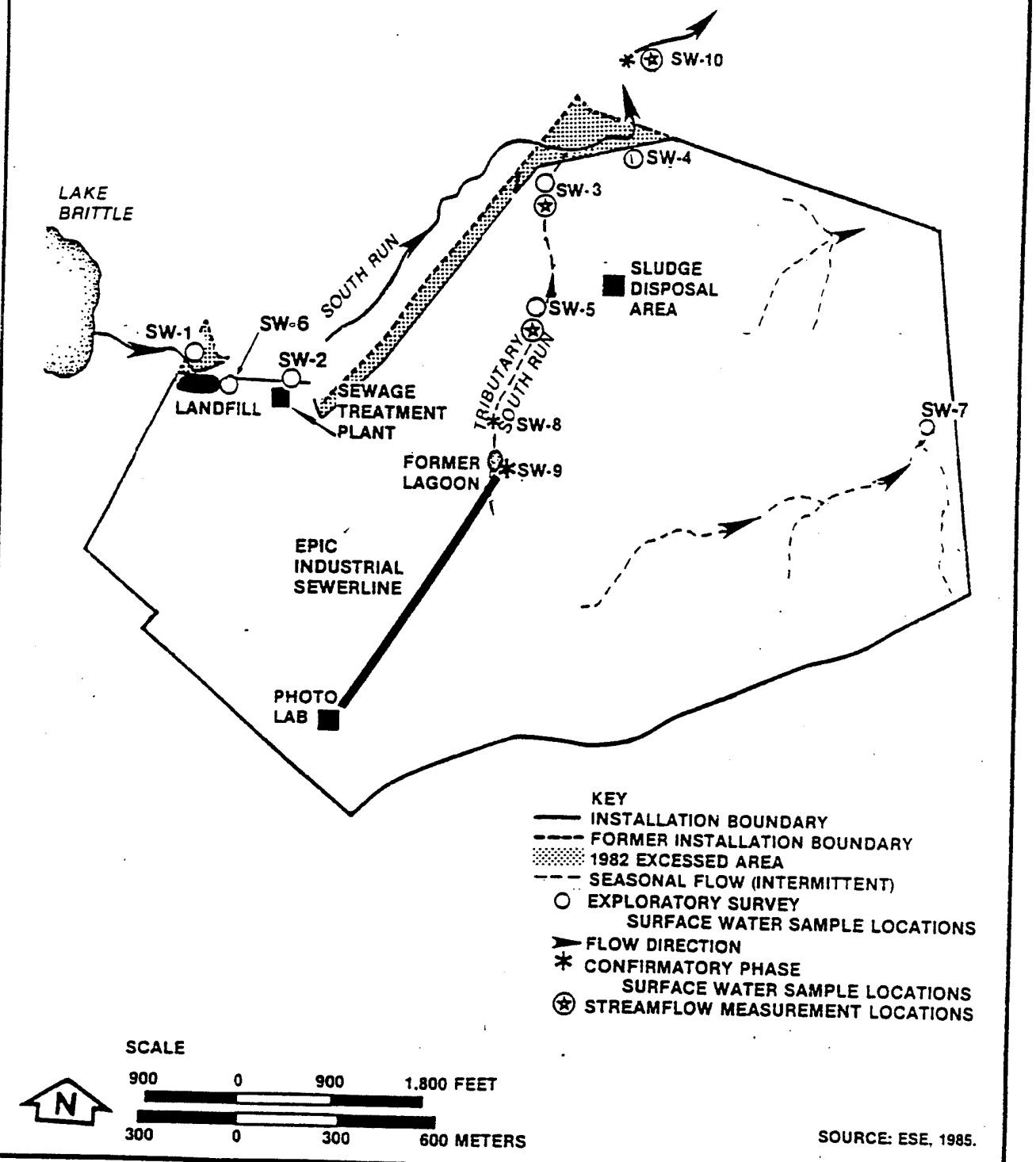


Figure 3.3-1
SURFACE WATER SAMPLING AND GAGING STATIONS

ENVIRONMENTAL CONTAMINATION SURVEY
Vint Hill Farms Station
Warrenton, Virginia

U.S. Army
Toxic and Hazardous Materials Agency
Aberdeen Proving Ground, Maryland

Table 6.1-2. Summary of Exploratory Survey Surface Water Quality at VHFS- -Aug. 1 and 2, 1984

Sample Location and Identification (see Fig 6.1-3)	Concentration (ug/L) of:			Concentration (ug/L) of Dissolved Metals					Concentration (ug/L) of Volatile or Extractable Organics*		
	Free CN	Total CN	Phenols	Cd	Cr	Pb	Hg	Ag	MeCl	Dioctyl Phthalate	Bis(2-Ethyl Hexyl) Phthalate
South Run											
SW001	<4.5	<4.0	<6	<2.9	<5.0	<13.7	<0.2	-	<1	40	30
SW002	20.5	34.0	<6	<2.9	<5.0	<13.7	0.2	-	6	<10	<20
Lagoon and Sludge Disposal Area Drainages											
SW003	10.7	213	<6	<2.9	<5.0	<13.7	0.3	0	<1	40	<20
SW004	Dry, No Flowing or Standing Water										
SW005	14.1	146	<6	<2.9	<5.0	<13.7	<0.2	-	N/A	N/A	N/A
Landfill Area Drainage											
SW006	<4.5	<4.0	<6	<2.9	<5.0	<13.7	<0.2	-	<1	<10	<20
Eastern Drainage											
SW007	Dry, No Flowing or Standing Water										

*No other volatile or extractable organics were detected in any samples by GC/MS. See App. E for the complete organic database.

Abbreviations:
Ag = silver
Cd = cadmium
CN = cyanide
Cr = chromium
Hg = mercury
MeCl = methylene chloride
N/A = not analyzed
ug/L = micrograms per liter

Source: ESE, 1985.

Table 6.1-3. Confirmatory Phase Water Quality Results, May 29 and 30, 1985

Sample Location (see Fig. 6.1-3)	Sample Site I.D.	Concentration of Cyanide (ug/L) as: Free Cyanide	Total Cyanide
Ground Water			
GW05W	See Table 6.1-1	<4.5	<4.0
GW07W	See Table 6.1-1	<4.5	<4.0
Surface Water			
SW001	See Table 6.1-2	<4.5	<4.0
SW002	See Table 6.1-2	<4.5	19.1
SW003	See Table 6.1-2	13.2	81.9
SW005	See Table 6.1-2	14.6	43.3
SW008	Downstream of EPIC Outfall	<4.5	4.7
SW009	Upstream of EPIC Outfall	<4.5	<4.0
SW010	Downstream of VHFS in South Run	<4.5	6.0

Source: ESE, 1985.

SOILS, SEDIMENTS, AND SLUDGES SAMPLING DATA

SOURCE: ESE 1981

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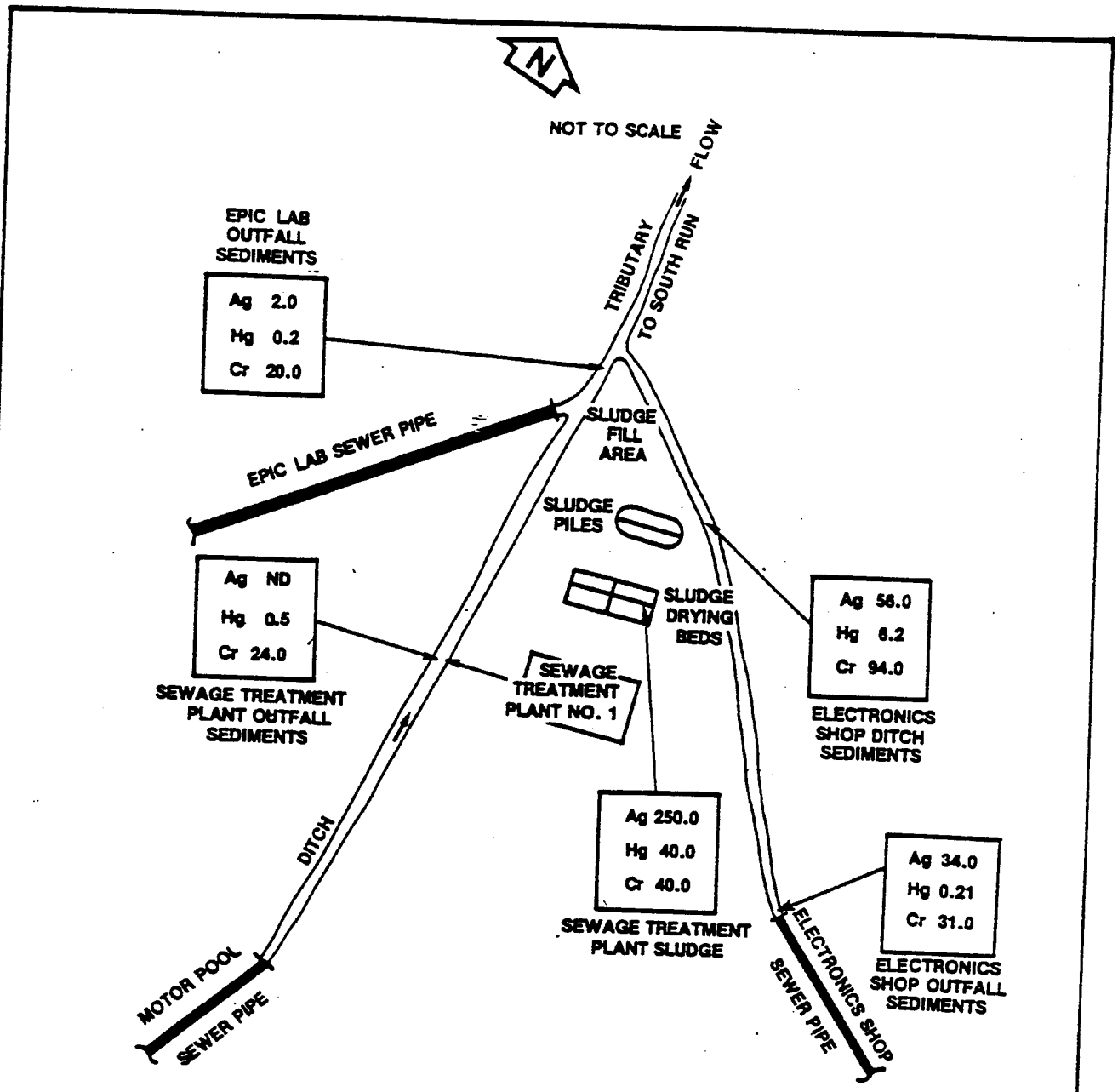


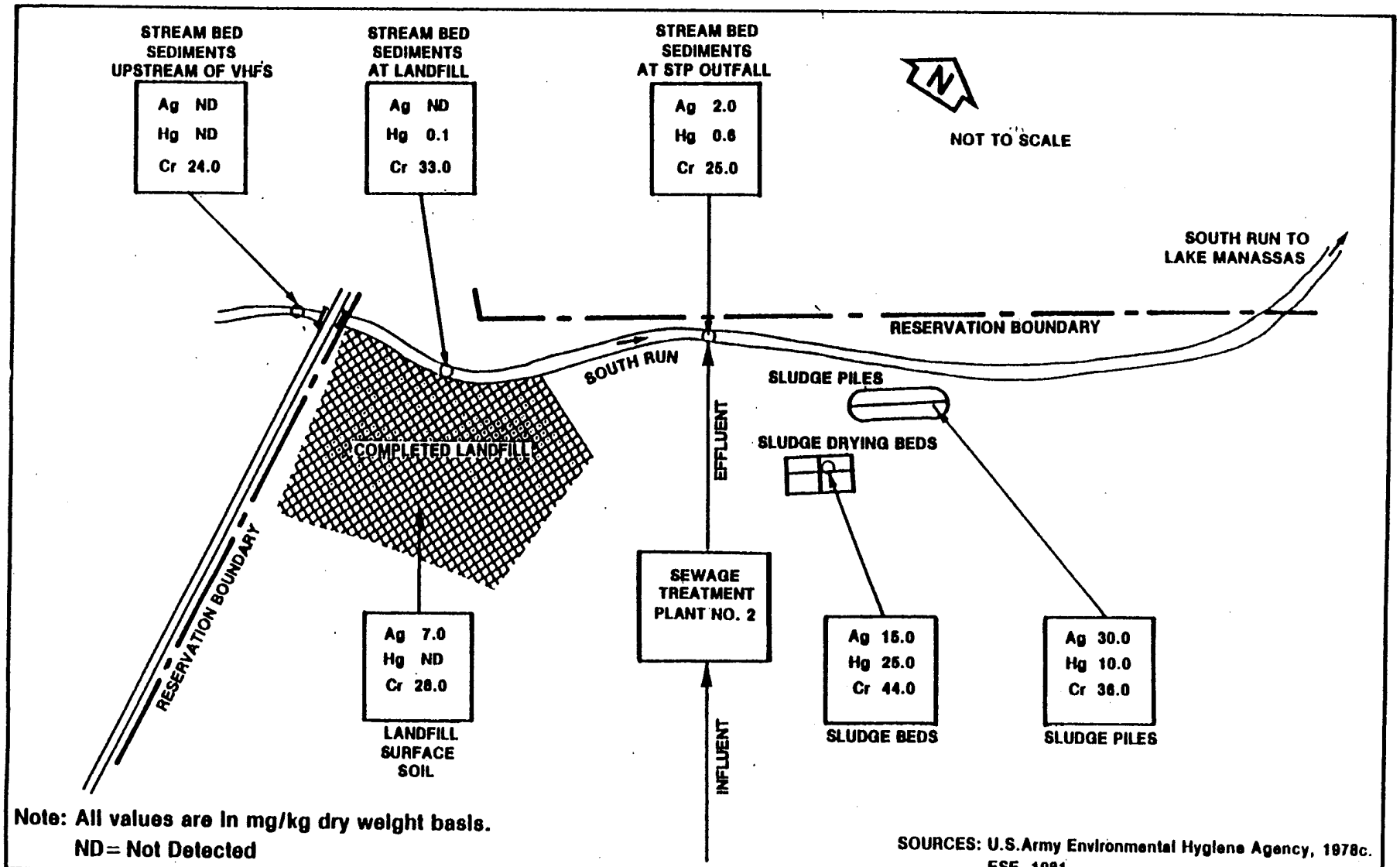
Note: All values mg/kg dry weight basis.
ND = Not Detected

SOURCES: U.S. Army Environmental Hygiene Agency, 1978c.
ESE, 1981.

Figure 2.3-3

TRACE METAL CONCENTRATIONS IN SOILS, SEDIMENTS, AND SLUDGES AT SEWAGE TREATMENT PLANT NO. 1 IN 1978.

Prepared for:
U.S. Army Toxic and Hazardous Materials Agency
Aberdeen Proving Ground, Maryland



Note: All values are in mg/kg dry weight basis.
ND = Not Detected

SOURCES: U.S. Army Environmental Hygiene Agency, 1978c.
ESE, 1981.

Figure 2.3-4
TRACE METAL CONCENTRATIONS IN SOILS, SEDIMENTS, AND SLUDGES AT SEWAGE TREATMENT PLANT NO. 2 IN 1978.

Prepared for:
U.S. Army Toxic and Hazardous Materials Agency
Aberdeen Proving Ground, Maryland

AUTO CRAFT SHOP UST SAMPLING DATA

SOURCE: VERSAR 1990

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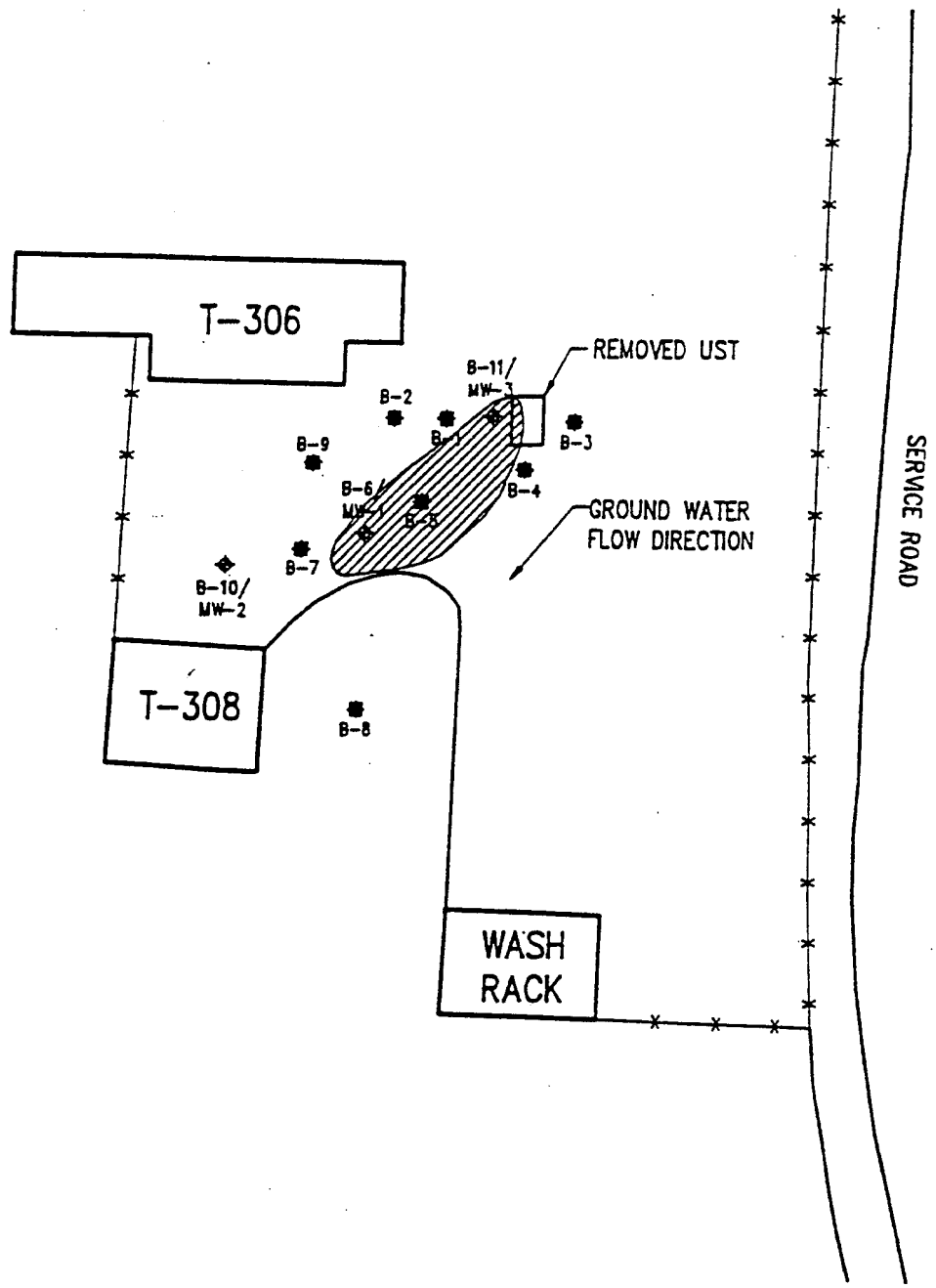

◆ BORING AND MONITOR WELL

● BORING

▨ APPROXIMATE AREA OF GROUND-WATER CONTAMINATION

VINT HILL FARMS STATION MILTARY RESV.

DESIGNED CAMPBELL	DATE 9/28/90
DRAWN CAROLINO	10/01/90
CHECKED	

SITE PLAN
ALL LOCATIONS APPROXIMATE

Versar INC.
6850 VERSAR CENTER
SPRINGFIELD, VIRGINIA 22151
(703) 750-3000

APPROVAL	DATE
PROJECT NO. 7235.002	SCALE: NONE
DRAWING NO. 723502-3	FIGURE 3

Versar INC

TABLE 2.

LABORATORY DATA FOR SOILS COLLECTED FROM
SPLIT-SPOON SAMPLES, AUGUST 27, 1990

Boring Number	Parameter	Result
B-1	TPH	None detected
B-3	TPH	None detected
B-4	TPH	1 ppm (gasoline)
B-5	TPH	2 ppm (gasoline)
B-11	TPH	130 ppm (gasoline)
B-5	VOCs	
	2-Butanone	73 ppb
	1,1,1-Trichloroethane	18 ppb*
	4-Methyl-2-pentanone	200 ppb
	Benzene	61 ppb
	Toluene	76 ppb
	Ethylbenzene	380 ppb
	Total xylenes	1,100 ppb
B-7	VOCs	None detected
B-11	VOCs	
	Total xylenes	9 ppb*

*Estimated concentration - below method detection limit.

Method detection limits provided on laboratory data sheets - Appendix A.

Versar INC.

TABLE 3.

LABORATORY DATA FOR GROUND-WATER SAMPLES
COLLECTED AUGUST 27, 1990

Monitoring Well Number	Parameter	Result
MW-1	TPH	15 ppm (gasoline)
MW-2	TPH	None detected
MW-3	TPH	3 ppm (gasoline)
MW-1	VOCs	
	Benzene	660 ppb
	4-Methyl-2-pentanone	150 ppb
	Ethylbenzene	1,200 ppb
	Total xylenes	1,300 ppb
MW-2	VOCs	None detected
MW-3	VOCs	
	Benzene	230 ppb
	4-Methyl-2-pentanone	150 ppb
	Toluene	26 ppb
	Ethylbenzene	93 ppb
	Total xylenes	76 ppb

Method detection limits provided on laboratory data sheets - Appendix A.

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IMMC NEUTRALIZATION PIT SAMPLING DATA

SOURCE: ERC 1991

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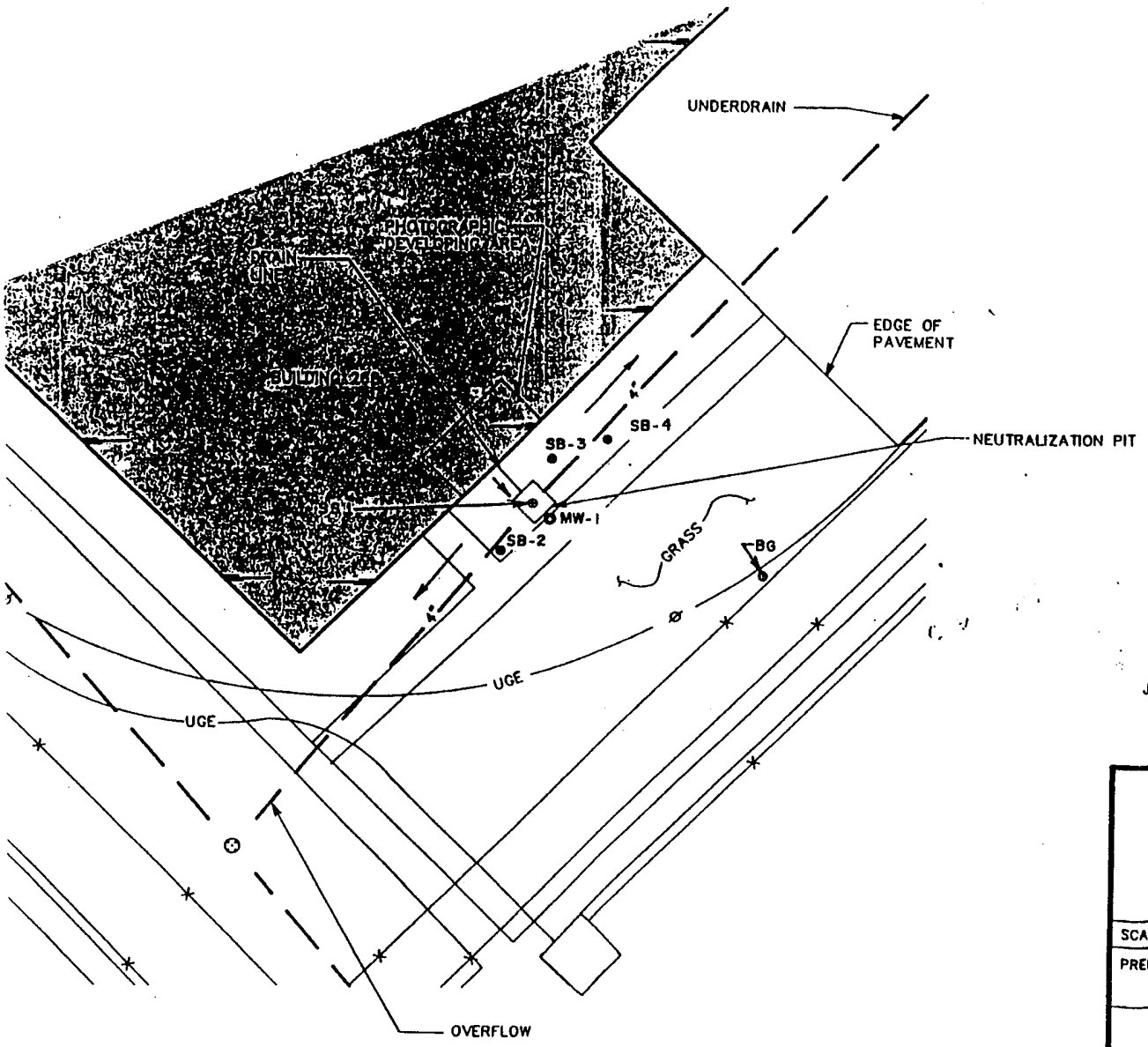

LEGEND

- POWER POLE
- MANHOLE
- SOIL BORING
- SURFACE SAMPLE
- GROUNDWATER MONITORING WELL/ SOIL BORING
- FENCE
- UGE — UNDERGROUND ELECTRIC
- 4" — SANITARY SEWER

NOTE

PLAN ADAPTED FROM DRAWING BY PURDUM AND JESCHKE CONSULTING ENGINEERS DATED JULY 1, 1982.

FIGURE 1.4
NEUTRALIZATION PIT
SITE PLAN

SCALE: 1" = 20'	DR ALW	CHK SAH	REV EOW

PREPARED FOR:

ERCE

PROJ: D071-001	DATE: 10/22/90	SHEET OF

TABLE 1.1
SUMMARY OF POSITIVE RESULTS FOR SOIL SAMPLES

Sample	MW-13	MW1-24	SB2-9	SB2-19	SB3-10	SB3-11	Soil Action Level (RCRA)
Location	Well 1	Well 1	Boring 2	Boring 2	Boring 3	Duplicate SB3-10	
Depth	13	24	9	19	10	10	
ANALYTE	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Arsenic	52	65	68	56	59	64	80
Barium	150	430	340	310	230	220	40001
Total Cyanide	ND	ND	ND	ND	ND	NA	2000
Chromium	27	15	23	13	14	16	4002
Mercury	3	0.17	ND	ND	ND	ND	20
Nitrate-Nitrite as N	28	20	10	23	76	78	NA
Lead	11	3.6	8.7	5.3	5.9	4.4	NA
Acetone	ND	NA	ND	NA	ND	0.26	8000
Carbon Disulfide	ND	NA	ND	NA	ND	ND	8000
Methylene Chloride	ND	NA	0.0027	NA	0.0027	0.0023	90

1 Ionic
2 As Chromium VI
ND - NOT DETECTED
NA - NOT ANALYZED OR NOT APPLICABLE

TABLE 1.1 (CONTINUED)
SUMMARY OF POSITIVE RESULTS FOR SOIL SAMPLES

Sample	SB3-16	SB4-11	SB4-17	BG	SS1	SS2	Soil Action Level (RCRA)
Location	Boring 3	Boring 4	Boring 4	Background	Pit	Pit Duplicate	
Depth	16	11	17	0.5	0.5	0.5	
ANALYTE	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Arsenic	73	86	77	46	130	NA	80
Barium	530	460	490	79	140	NA	4000[1]
Total Cyanide	ND	ND	ND	NA	1.5	NA	2000
Chromium	18	28	25	32	50	NA	400[2]
Mercury	0.32	ND	ND	ND	3.4	NA	20
Nitrate-Nitrite as N	17	5.2	4.2	ND	3.3	NA	NA
Lead	5.1	5.9	4.7	12	12	NA	NA
Acetone	NA	0.039	NA	NA	ND	ND	8000
Carbon Disulfide	NA	ND	NA	NA	0.04	0.0042	8000
Methylene Chloride	NA	0.002	NA	NA	0.0018	0.0024	90

1 Ionic
2 As Chromium VI
ND - NOT DETECTED
NA - NOT ANALYZED OR NOT APPLICABLE

TABLE 1.2
SUMMARY OF POSITIVE RESULTS GROUND WATER SAMPLES

Sample	MW 1	MW2	Drinking Water MCL
Location	Well 1	Well 1 Duplicate	
ANALYTE	(ug/l)	(ug/l)	(ug/l)
Barium	380	NA	5000
Total Cyanide	2800	3300	200
Mercury	180	NA	2
Nitrate-Nitrite as N	33000	NA	10000
Lead	3.6	NA	5
Total Phenolics	22	22	30[2,3]
Conductivity (umhos/cm)	950	NA	NA
pH	5.3	NA	6.5-8.5[2]
Total Dissolved Solids	690,000	NA	500,000[2]
Acetone	40	43	4000[1]
Benzene	1	ND	5
Carbon Disulfide	3.2	ND	4000[1]
Dibromomethane	1.9	1.8	NA
Ethyl Benzene	8.4	9	700/30[2]
Methylene Chloride	14	13	5
Tetrachloroethene	58	56	5
Total Xylenes	25	26	10,000/20[2]
Trichloroethene	37	35	5

1 RCRA Action Level. MCL not available.
2 Secondary MCL not enforceable.
3 As Pentachlorophenol.
ND - NOT DETECTED
NA - NOT ANALYZED OR NOT APPLICABLE

APPENDIX E: RESULTS OF FEDERAL AND STATE DATA BASE SEARCH

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VISTA
NATIONAL RADIUS PROFILE

VISTA Report #: 6/028730-001 Date of Report: 10/26/93

Ref/Loan #: VINT HILL FARMS STATION
Client: JOHN WHELPLEY, SAIC - MCLEAN
1710 GOODRIDGE DR, MCLEAN, VA 22102
Subject
Property: SR 652
WARRENTON, VA 22186

SUMMARY OF FEDERAL RECORDS FOUND

Database & Date	Agency and Type of Records	0 to 1/4 mi	1/4 to 1/2 mi	1/2 to 1 1/4 mi	1 1/4 to 1 1/2 mi	1 1/2 to 2 mi	TOTAL
NPL 06/93	US EPA Superfund Sites	0	0	0	0	0	0
CERCLIS 09/93	US EPA Potential Superfund Sites	0	0	0	0	--	0
RCRA-LgGen 07/93	US EPA RCRA Large Quantity Generators	0	0	0	--	--	0
RCRA-SmGen 07/93	US EPA RCRA Small and Very Small Quantity Generators	0	0	0	--	--	0
RCRA-TSD 07/93	US EPA RCRA Treatment,Storage,and/or Disposal Sites	0	0	0	0	0	0
RCRA-Transp 07/93	US EPA RCRA Transporters	0	0	0	--	--	0
ERNS 09/93	US EPA	0	0	0	0	0	0
	FEDERAL RECORDS Sub-total:	0	0	0	0	0	0

Note: 1) A dash (--) indicates the list is not searched at that distance.
2) Sites often have a record in more than one database.

 For more information call: (619) 450-6100

VISTA
NATIONAL RADIUS PROFILE

VISTA Report #: 6/028730-001 Date of Report: 10/26/93

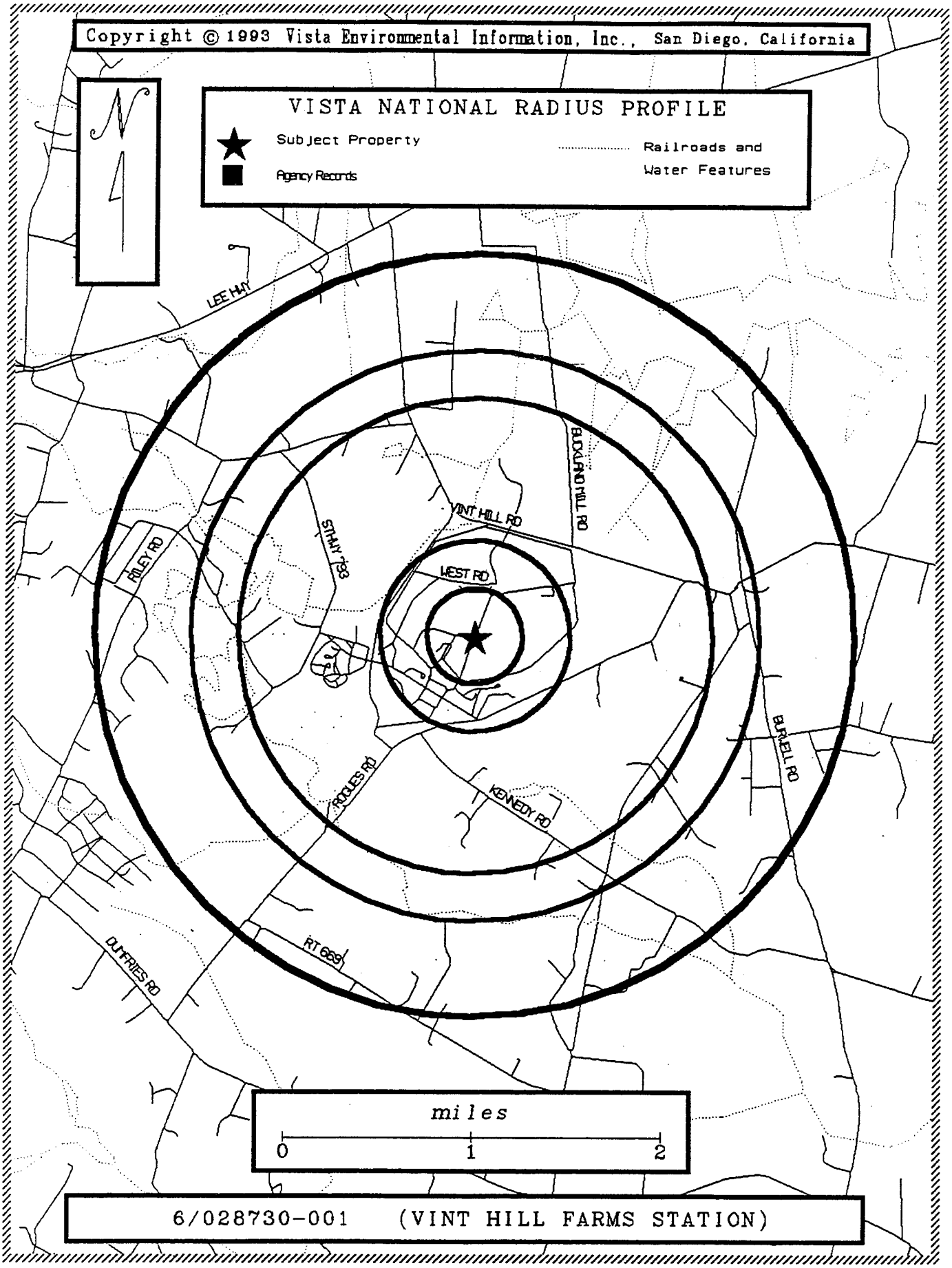
Ref/Loan #: VINT HILL FARMS STATION
Client: JOHN WHELPLEY, SAIC - MCLEAN
1710 GOODRIDGE DR, MCLEAN, VA 22102
Subject
Property: SR 652
WARRENTON, VA 22186

SUMMARY OF STATE RECORDS FOUND

Database & Date	Agency and Type of Records	0 to 1/4 mi	1/4 to 1/2 mi	1/2 to 1 1/4 mi	1 1/4 to 1 1/2 mi	1 1/2 to 2 mi	TOTAL
SPL 07/90	Department of Environmental Control Active Sites Cleanup Program	0	0	0	0	0	0
LUST 03/93	DEQ-Water Division Pollution Remediation Program - LUST Sites	0	0	0	0	--	0
SWLF 06/93	Department of Environmental Control Solid Waste Management Facilities	0	0	0	0	--	0
UST's 10/92	Department of Environmental Control Underground Storage Tank Program Database	0	0	0	--	--	0
	STATE RECORDS Sub-total:	0	0	0	0	0	0
	TOTAL:	0	0	0	0	0	0

Note: 1) A dash (--) indicates the list is not searched at that distance.
2) Sites often have a record in more than one database.

 For more information call: (619) 450-6100



6/028730-001 (VINT HILL FARMS STATION)

VISTA NATIONAL RADIUS PROFILE

VISTA Report #: 6/028730-001

Date of Report: 10/25/93

UNMAPPABLE SITES

Unmappable sites are environmental risk sites that cannot be geocoded, but can be located by zip code or city name.

In general, a site cannot be geocoded because of inaccurate or missing locational information in the record provided by the agency. For many of these records, VISTA has corrected or added locational information by using U.S. Postal address validation files and proprietary programming that adds locational information from private industry address files. However, many site addresses cannot be corrected using these techniques and those sites cannot be mapped.

Of the sites that cannot be mapped, VISTA identifies those that have complete zip code or city name information. All ungeocoded sites that have a ZIP code in the radius are considered for inclusion. Ungeocoded sites that do not have a ZIP code but do have a street name are considered for inclusion if they have a city in the radius. An ungeocoded record may be excluded if it can be determined to be outside the relevant radius searched for a particular database.

For more information call: (619) 450-6100

VISTA NATIONAL RADIUS PROFILE

10/25/93

VISTA Report #: 6/028730-001

UNMAPPABLE SITES

CERCLIS

SITE NAME AND ADDRESS	VISTA ID	EPA ID / AGENCY ID
USA VINT HILL FARMS STATION: UNOBTAINABLE, WARRENTON 22186	3167199	
Status : NOT PROP/CURR/DELE NPL		VA8210020931
Site Ownership : FEDERALLY OWNED		
Lead Agency : NO DETERMINATION		
Site Events :		
Event Type : PRELIMINARY ASSESSMENT		
Event Type : DISCOVERY		
Lead Agency : FUND LEAD		

For more information call: (619) 450-6100

RCRA-LgGen

SITE NAME AND ADDRESS	VISTA ID	EPA ID / AGENCY ID
HUNT, RICK FORD: RT 6 BOX 2, WARRENTON 22186	203226	
Generator Class :Generators who generate at least 1000 kg./month of non-acutely hazardous waste (or 1 kg./month of acutely hazardous waste).		VAD063206130

RCRA-SmGen

SITE NAME AND ADDRESS	VISTA ID	EPA ID / AGENCY ID
E P A ENVIRONMENTAL PHOTO INTERP CTR: BLDG 166 VINT HILL FARMS STA, WARRENTON 22186	3968827	
Generator Class :Generators who generate 100 kg./month but less than 1000 kg./month of non-acutely hazardous waste		VA7690590024
CARTER MACHINERY CO INC - WARRENTON: WARRENTON INDUSTRIAL PK, WARRENTON 22186	3968845	
Generator Class :Generators who generate 100 kg./month but less than 1000 kg./month of non-acutely hazardous waste		VAD981741739

VISTA NATIONAL RADIUS PROFILE

10/25/93

VISTA Report #: 6/028730-001

UNMAPPABLE SITES

SWLF

SITE NAME AND ADDRESS	VISTA ID	EPA ID / AGENCY ID
VINT HILL FARMS STATION LF: FAUQUIER, WARRENTON 22186	455085	
Facility Type : SANITARY LANDFILL		0475072
Facility Status : CLOSED		
Owner Name : US ARMY		
Owner Address :		

For more information call: (619) 450-6100

UST's

SITE NAME AND ADDRESS	VISTA ID	EPA ID / AGENCY ID
RICKS AUTO BODY: RT. 6 BOX 289, WARRENTON 22186	684606	
Number of Underground Tanks: 1 Contents:KEROSENE,		9306
ROUND HILL TEXACO: RT. 7, WARRENTON 22186	686706	
Number of Underground Tanks: 3 Contents:GASOLINE (UNSPECIFIED),		8918
NORTH WALES: RT. 2 BOX 78, WARRENTON 22186	688083	
Number of Underground Tanks: 9 Contents:DIESEL,GASOLINE (UNSPECIFIED),		2723
WARRENTON FACILITY: RT. 5 BOX 1, WARRENTON 22186	690155	
Number of Underground Tanks: 5 Contents:DIESEL,GASOLINE (UNSPECIFIED),OIL(NOT SPECIFIED),		1915
NEAL JAMES S: RT. 2 BOX 915, NOKESVILLE 22123	694020	
Number of Underground Tanks: 1 Contents:KEROSENE,		7882
NEW BALTIMORE GARAGE: P.O. BOX 986, WARRENTON 22186	695973	
Number of Underground Tanks: 2 Contents:GASOLINE (UNSPECIFIED),OIL(NOT SPECIFIED),		8891
PORTER S PRENTICE: P.O. BOX 1126, WARRENTON 22186	696305	
Number of Underground Tanks: 3 Contents:DIESEL,GASOLINE (UNSPECIFIED),		8723

UST's

SITE NAME AND ADDRESS	VISTA ID	EPA ID / AGENCY ID
POLAND HELEN M D V M: P.O. BOX 1107, WARRENTON 22186	697791	
Number of Underground Tanks: 1 Contents:GASOLINE (UNSPECIFIED),		8694
RENT A CAR CO INC: RT. 6 BOX 301, WARRENTON 22186	698302	
Number of Underground Tanks: 2 Contents:DIESEL,GASOLINE (UNSPECIFIED),		9217
MEADOWS MEL V: RT. 1 BOX 469-A "OLD WATERLOO R, WARRENTON 22186	699952	
Number of Underground Tanks: 2 Contents:GASOLINE (UNSPECIFIED),DIESEL,		7349
TRIBLE EQUIPMENT INC: RT. 3 BOX 239, WARRENTON 22186	700404	
Number of Underground Tanks: 3 Contents:GASOLINE (UNSPECIFIED),DIESEL,OIL(NOT SPECIFIED),		11309
MID-ATLANTIC COCA-COLA BOTTLING: RT. 3 BOX 1260, GAINESVILLE 22065	702745	
Number of Underground Tanks: 5 Contents:KEROSENE,DIESEL, Number of Underground Tanks: 1 Contents:GASOLINE (UNSPECIFIED),		12799
THOMAS A GREENLAND: RT. 1 BOX 226, WARRENTON 22186	702753	
Number of Underground Tanks: 1 Contents:GASOLINE (UNSPECIFIED),		3582
MRS PAUL BOWDEN: RT. 2 BOX 86, WARRENTON 22186	702787	
Number of Underground Tanks: 1 Contents:GASOLINE (UNSPECIFIED),		3582

UST's

SITE NAME AND ADDRESS	VISTA ID	EPA ID / AGENCY ID
#6 WARRENTON CO RESCUE UNIT: , WARRENTON 22186	3382308	
Number of Underground Tanks: 1		14119
FAUQUIER AUTO PARTS: BY PASS, WARRENTON 22186	3382309	
Number of Underground Tanks: 1		2054
FAUQUIER SPRINGS COUNTRY CLUB: BOX 666, WARRENTON 22186	3382310	
Number of Underground Tanks: 1 Contents:GASOHOL,		13563
HAZEL ELECTRIC: , WARRENTON 22186	3382311	
Number of Underground Tanks: 2 Contents:GASOLINE (UNSPECIFIED),		3009
* VINT HILL FARMS STATION: VARIOUS BUILDINGS, WARRENTON 22186	3391439	
Number of Underground Tanks: 13 Contents:GASOLINE (UNSPECIFIED),DIESEL,		11624

*

Although the unmappable record marked with an asterisk contains site name or address information similar to that of your subject property, the information contained in the agency data is insufficient to map the site. If you have any questions, please contact Customer Service at (800) 733-7606.

DESCRIPTION OF DATABASES SEARCHED

Below are general descriptions of the federal and state databases that VISTA searches for the National Radius Profile.

FEDERAL DATABASES

Please check the "Summary of Federal Records Found" to determine the specific dates of the federal databases searched for this profile.

U.S. EPA: NPL

The National Priorities List (NPL) is the EPA's database of uncontrolled or abandoned hazardous waste sites identified for priority remedial action under the Superfund Program. A site, to be included on the NPL, must either meet or surpass a predetermined hazard ranking systems score, or be chosen as a state's top-priority site, or meet all three of the following criteria:

1) The US Department of Health and Human Services issues a health advisory recommending that people be removed from the site to avoid exposure.
2) The EPA determines that the site represents a significant threat.
3) The EPA determines that remedial action is more cost-effective than removal action.

U.S. EPA: CERCLIS

The CERCLIS List is a compilation by the EPA of the sites which the EPA has investigated or is currently investigating for a release or threatened release of hazardous substances pursuant to the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA or Superfund Act).

U.S. EPA: RCRA (RCRIS/HWDMS)

The EPA's Resource Conservation and Recovery Act (RCRA) Program identifies and tracks hazardous waste from the point of generation to the point of disposal. The RCRA Facilities database is a compilation by the EPA of reporting facilities that generate, transport, treat, store or dispose of hazardous waste.

STATE DATABASES

Please check the "Summary of State Records Found" to determine if the following type of databases are available from VISTA for the state in which the subject property of this report is located. Please note that if the Summary does not list one of the following databases, it is not currently available. You may also determine the specific names and dates of the databases searched for this profile in the summary.

STATE: SPL

The State Priority List is a generic name for databases maintained by many states that contain sites considered to be actually or potentially contaminated and presenting a possible threat to human health and the environment. These sites are generally listed by the state to warn the public or as a part of an an investigation and cleanup program managed by the state.

STATE: LUST

This is a database maintained by state or local agencies of known or suspected leaking underground storage tanks.

STATE: UST

This is a database maintained by state or local agencies of registered underground storage tanks.

STATE: SWLF

This is a database maintained by state or local agencies of Solid Waste Landfills, Incinerators, and transfer stations.

VISTA ENVIRONMENTAL INFORMATION

FEDERAL REPORT

Client Project/P.O. No.:	010827036521	VISTA Report No.:	028730001
Client Reference Name:		Date of Report:	Oct. 20, 1993

Subject Property:	VINT HILL FARMS STATION
Street Address:	SR 652
City:	WARRENTON
State:	VA
Zip:	22186
County:	FAUQUIER

SITES IN THE AREA

Agency/Database	Date of Data	# of Sites In Zip Code	# of Sites In Area
US,EPA,ERNS	10/92	12	0

For a description of this report please turn to the last page.

FOR MORE INFORMATION CALL (619)450-6100

5060 Shoreham Place, Suite 300, San Diego, CA 92122

VISTA ENVIRONMENTAL INFORMATION

ERNS Sites

Client Project/P.O. No.:	010827036521	VISTA Report No.:	028730001
Client Reference Name:		Date of Report:	Oct. 20, 1993

Site Description

Subject Property:	VINT HILL FARMS STATION
Address:	SR 652
City:	WARRENTON
State:	VA
Zip:	22186
County:	FAUQUIER

The ERNS database has many sites with incomplete zip code information. For this reason, the search includes not only sites within the zip code(s) but any sites within the city which contain the street name of the subject property or any other client specified street name.

The Emergency Response Notification System (ERNS) is a national database used to collect information on reported releases of oil and hazardous substances. The database contains information from spill reports made to federal authorities including the EPA, the US Coast Guard, the National Response Center and the Department of transportation. A search of the database records for the period of 1987-1991 revealed the following information regarding reported spills of oil or hazardous substances in the stated zip code area(s).

A search of the 10/92 ERNS database revealed the following sites within the zip code area of the subject property.

SITES IN THE AREA

ERNS Spill Details

Spill Date	:	/0/7//1989	Vista ID#:	200107147
Spill Time	:	10:45 AM	Case Number:	
Spill Location	:	N/A		
Spill City	:	WARRENTON		
Spill State	:	VA		
Spill Zip	:			
VISTA Enhanced Zip	:	22186		
Spill County	:	FAUQUIER		
Source/Agency	:			

 For more information call: (619) 450-6100

N/A Continued

Discharger Name	:	
Discharger Org	:	USA - VINT HILL FARMS STATION
Discharger Addr	:	
Discharger Phone	:	703-349-5111
Discharger County	:	
Discharger City	:	WARRENTON
Discharger St/Zip	:	VA, 22186-
Material Spilled	:	PCB (60%) , 2.00, GAL
Medium Affected	:	Land
Water Way Affected	:	CONCRETE AREA IN VAULT ONLY.

ERNS Spill Details

Spill Date	:	03/30/1989	Vista ID#:	200116699
Spill Time	:	: AM	Case Number:	
Spill Location	:	N/A		
Spill City	:	WARRENTON		
Spill State	:	VA		
Spill Zip	:			
VISTA Enhanced Zip	:	22186		
Spill County	:	FAUQUIER		
Source/Agency	:			
Discharger Name	:			
Discharger Org	:	USA - VINT HILL FARMS STATION		
Discharger Addr	:			
Discharger Phone	:	7033476433		
Discharger County	:			
Discharger City	:	WARRENTON		
Discharger St/Zip	:	VA, 22186		
Material Spilled	:	WHITE CORROSIVE GEL , 50.00, GAL		
Medium Affected	:	Water		
Water Way Affected	:	N/A		

ERNS Spill Details

Spill Date	:	/1/0//1987	Vista ID#:	200143080
Spill Time	:	7:00 AM	Case Number:	

Spill Location	:	N/A
Spill City	:	WARRENTON
Spill State	:	VA
Spill Zip	:	
VISTA Enhanced Zip	:	22186
Spill County	:	FAUQUIER
Source/Agency	:	
Discharger Name	:	
Discharger Org	:	HARKAWAY FARM
Discharger Addr	:	ROUTE 628 NORTH
Discharger Phone	:	0
Discharger County	:	
Discharger City	:	WARRENTON
Discharger St/Zip	:	VA, 221860000
Material Spilled	:	BURNING DEBRIS AND POISON IVY , 0.00, UNK
Medium Affected	:	Land
Water Way Affected	:	GROUND AND AIR RELEASE

ERNS Spill Details

Spill Date	:	09/25/1990	Vista ID#:	200092756
Spill Time	:	09:00 AM	Case Number:	41020
Spill Location	:	310 BROADVIEW AVE		
Spill City	:	WARRENTON		
Spill State	:	VA		
Spill Zip	:			
VISTA Enhanced Zip	:	22186		
Spill County	:	FAUQUIER		
Source/Agency	:			
Discharger Name	:	UNKNOWN,		
Discharger Org	:			
Discharger Addr	:			
Discharger Phone	:			
Discharger County	:			
Discharger City	:			
Discharger St/Zip	:	,		
Material Spilled	:	GASOLINE: AUTOMOTIVE (4.23G PB/G, 00000000.00 , UNK		
Medium Affected	:	Water		
Water Way Affected	:	SEWER LINES		

ERNS Spill Details

Spill Date	:	/2/3//1988	Vista ID#:	200171191
Spill Time	:	: AM	Case Number:	
Spill Location	:	CANTERBURY VILLAGE		
Spill City	:	WARRENTON		
Spill State	:	VA		
Spill Zip	:			
VISTA Enhanced Zip	:	22186		
Spill County	:	FAQUIER		
Source/Agency	:			
Discharger Name	:			
Discharger Org	:			
Discharger Addr	:			
Discharger Phone	:	0		
Discharger County	:			
Discharger City	:			
Discharger St/Zip	:	,		
Material Spilled	:	GASOLINE , 0.00, UNK		
Medium Affected	:	Ground Water		
Water Way Affected	:	WELL WATER		

ERNS Spill Details

Spill Date	:	08/09/1990	Vista ID#:	200087993
Spill Time	:	09:45 AM	Case Number:	34715
Spill Location	:	731 FROST AVE, RT 211 W		
Spill City	:	WARRENTON		
Spill State	:	VA		
Spill Zip	:			
VISTA Enhanced Zip	:	22186		
Spill County	:	FAUQUIER		
Source/Agency	:			
Discharger Name	:	STODDARD, WILLIAM		
Discharger Org	:	TOWN OF WARRENTON		
Discharger Addr	:	PO DRAWER 341		
Discharger Phone	:	703-347-1104		
Discharger County	:			
Discharger City	:	WARRENTON		
Discharger St/Zip	:	VA, 22186		

731 FROST AVE, RT 211 W Continued

Material Spilled	:	CHLORINE , 00000001.00 , LBS
Medium Affected	:	Air
Water Way Affected	:	ATMOSPHERE

ERNS Spill Details

Spill Date	:	/1/3//1989	Vista ID#:	200188176
Spill Time	:	9:24 AM	Case Number:	
Spill Location	:	LAKE OFF OF NORDIX DR.		
Spill City	:	WARRENTON		
Spill State	:	VA		
Spill Zip	:			
VISTA Enhanced Zip	:	22186		
Spill County	:	FAUQUIER		
Source/Agency	:			
Discharger Name	:			
Discharger Org	:	UNKNOWN		
Discharger Addr	:			
Discharger Phone	:	0		
Discharger County	:			
Discharger City	:			
Discharger St/Zip	:	,		
Material Spilled	:	OILY MILKY LIQUID , 400.00, GAL		
Medium Affected	:	Water		
Water Way Affected	:	WARRINGTON LAKE		

ERNS Spill Details

Spill Date	:	/1/1//1989	Vista ID#:	200182136
Spill Time	:	6:30 AM	Case Number:	
Spill Location	:	OFF RTE 29 BY ERLICH RD		
Spill City	:	WARRENTON		
Spill State	:	VA		
Spill Zip	:			
VISTA Enhanced Zip	:	22186		
Spill County	:	FAUQUIER		
Source/Agency	:			

OFF RTE 29 BY ERLICH RD Continued

Discharger Name	:	
Discharger Org	:	VIRGINIA STATE HIGHWAY DEPT
Discharger Addr	:	
Discharger Phone	:	0
Discharger County	:	
Discharger City	:	
Discharger St/Zip	:	,
Material Spilled	:	ROAD TAR , 250.00, GAL
Medium Affected	:	Water
Water Way Affected	:	UNNAMED CREEK

ERNS Spill Details

Spill Date	:	10/11/1990	Vista ID#:	200094234
Spill Time	:	09:00 AM	Case Number:	43140
Spill Location	:	RTE 771		
Spill City	:	WARRENTON		
Spill State	:	VA		
Spill Zip	:			
VISTA Enhanced Zip	:	22186		
Spill County	:	FAUQUIER		
Source/Agency	:			
Discharger Name	:	UNKNOWN,		
Discharger Org	:	US ARMY		
Discharger Addr	:			
Discharger Phone	:			
Discharger County	:			
Discharger City	:			
Discharger St/Zip	:	,		
Material Spilled	:	QUAKER COAT SOLVENT , 00000000.00 , UNK		
Medium Affected	:	Land		
Water Way Affected	:	SOIL		

ERNS Spill Details

Spill Date	:	02/28/1992	Vista ID#:	200011716
Spill Time	:	12:00 AM	Case Number:	VA92314

Spill Location	:	U.S. ARMY WARRENTON TRAINING CENTER
Spill City	:	WARRENTON
Spill State	:	VA
Spill Zip	:	21286-
VISTA Enhanced Zip	:	22186
Spill County	:	FACQUIER
Source/Agency	:	
Discharger Name	:	GREG SICKLER
Discharger Org	:	US ARMY, WARRENTON TRAIN. CTR.
Discharger Addr	:	P.O. BOX 700
Discharger Phone	:	703-347-8122 -
Discharger County	:	FACQUIER
Discharger City	:	WARRENTON
Discharger St/Zip	:	VA, 21286-
Material Spilled	:	WOOD, TREE STUMPS, DEBRIS , 00000000.00 , UNK
Medium Affected	:	Land
Water Way Affected	:	NONE

ERNS Spill Details

Spill Date	:	02/28/1992	Vista ID#:	200013534
Spill Time	:	12:00 AM	Case Number:	VA92314
Spill Location	:	U.S. ARMY WARRENTON TRAINING CENTER		
Spill City	:	WARRENTON		
Spill State	:	VA		
Spill Zip	:	21286-		
VISTA Enhanced Zip	:	22186		
Spill County	:	FACQUIER		
Source/Agency	:			
Discharger Name	:	GREG SICKLER		
Discharger Org	:	US ARMY, WARRENTON TRAIN. CTR.		
Discharger Addr	:	P.O. BOX 700		
Discharger Phone	:	703-347-8122 -		
Discharger County	:	FACQUIER		
Discharger City	:	WARRENTON		
Discharger St/Zip	:	VA, 21286-		
Material Spilled	:	WOOD, TREE SLUMPS, DEBRIS , 00000000.00 , UNK		
Medium Affected	:	Land		
Water Way Affected	:	NONE		

ERNS Spill Details

Spill Date	:	07/03/1990	Vista ID#:	200084081
Spill Time	:	11:55 PM	Case Number:	29418
Spill Location	:	US ROUTE 29 5 MILES SOUTH OF WARRENTON, VA		
Spill City	:	WARRENTON		
Spill State	:	VA		
Spill Zip	:			
VISTA Enhanced Zip	:	22186		
Spill County	:	FAUQUIER		
Source/Agency	:			
Discharger Name	:	UNK,		
Discharger Org	:	QUARLES TRUCKING CO.		
Discharger Addr	:			
Discharger Phone	:			
Discharger County	:			
Discharger City	:			
Discharger St/Zip	:	,		
Material Spilled	:	OIL: DIESEL , 00000075.00 , GAL		
		GASOLINE: AUTOMOTIVE (4:23G PB/G, 00000025.00 , GAL		
Medium Affected	:	Land		
Water Way Affected	:	PAVEMENT		

12 site(s) found in the zip code area(s)

GLOSSARY

Description of Report:

This report is a compilation of federal environmental data which identifies environmental problem sites and activities from the records of the United States Environmental Protection Agency(US EPA). The data contained in this report are the result of a search of VISTA's proprietary database.

The VISTA database search is designed to identify all sites known to be located within the specified zip code(s). Because not all government records have complete and accurate addresses, VISTA uses Post Office verification software to assign or to correct zip codes where necessary. For those records which cannot be assigned a zip code, VISTA uses the specifed city name(s) to identify any sites which may be located in the zip code area. If no city name is reported, the county name is used.

Limitations Of Information

All information contained in this report was obtained from US EPA records. VISTA does not warrant the accuracy,timeliness,merchantability, completeness or usefulness of any information furnished, and the subscriber accepts any and all risks resulting from decisions made solely or in part on VISTA information.

FOR MORE INFORMATION CALL (619)450-6100

5060 Shoreham Place, Suite 300, San Diego, CA 92122

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