FINAL

U.S. Army Environmental Center

Community Environmental Response Facilitation Act (CERFA) Report

Woodbridge Research Facility
Woodbridge, Virginia

Prepared for:

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

Prepared by:

ARTHUR D. LITTLE, INC.
25 Acorn Park
Cambridge, Massachusetts 02140-2390

Requests for this document must be referred to:
Commander, U.S. Army Environmental Center
Aberdeen Proving Ground, Maryland 21010

APRIL 1994

Final Report

Community Environmental Response Facilitation Act (CERFA)

Arthur D Little

Woodbridge Research Facility,
Woodbridge, Virginia

Program Manager, Robert Lambe — Date: 13 APRIL 94

Task Manager, Karen Jones — Date: 4-13-94

Submitted to

U.S. Army Environmental Center (USAEC)
Aberdeen Proving Ground, MD

Revision 1
April 13, 1994

Arthur D. Little, Inc.
Acorn Park
Cambridge, Massachusetts
02140-2390

ADL Reference 67070-27

DAAA15-91-D-0016
Delivery Order 0010

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1. AGENCY USE ONLY (Leave blank)	2. REPORT DATE	3. REPORT TYPE AND DATES COVERED
	April 1994	Final Report

4. TITLE AND SUBTITLE
Community Environmental Response Facilitation Act (CERFA) Report, Woodbridge Research Facility, VA

5. FUNDING NUMBERS
DAAA15-91-D-0016

6. AUTHOR(S)
Karen Jones

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
Arthur D. Little, Inc.
25 Acorn Park
Cambridge, MA 02140-2390

8. PERFORMING ORGANIZATION REPORT NUMBER
67070-27

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)
U.S. Army Environmental Center
Aberdeen Proving Ground, Maryland 21010

10. SPONSORING/MONITORING AGENCY REPORT NUMBER

11. SUPPLEMENTARY NOTES
Project Manager, Dominique Edwards

12a. DISTRIBUTION/AVAILABILITY STATEMENT

12b. DISTRIBUTION CODE

13. ABSTRACT *(Maximum 200 words)*

See Attached Page 2.

14. SUBJECT TERMS

15. NUMBER OF PAGES
± 200

16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT
Unclassified	Unclassified	Unclassified	UL

Report Documentation Page (continued)

This report presents the results of the Community Environmental Response Facilitation Act (CERFA) investigation conducted by Arthur D. Little, Inc. at Woodbridge Research Facility (WRF), a U.S. Government property selected for closure by the Base Realignment and Closure (BRAC) Commission under Public Laws 100-526 and 101-510. The primary objective of this investigation as required under CERFA (Public Law 102-426), is for Federal agencies to expeditiously identify real property offering the greatest opportunity for immediate reuse and redevelopment. Satisfying this objective requires the identification of real property where no Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)-regulated hazardous substances or petroleum or their derivatives were stored for one year or more, known to have been released, or disposed of.

The property examined under this investigation is a 579-acre site located in Woodbridge County, Virginia, approximately 2 miles west of downtown Alexandria, Virginia. The installation's primary mission is to conduct electromagnetic pulse (EMP) research and testing and, more specifically, to investigate and study the effects of EMP produced by exo-atmosphere nuclear weapons detonation on communications and other military systems.

Areas of the facility that have no history of hazardous substance or petroleum product release, disposal, or storage are categorized as CERFA parcels. Arthur D. Little's investigation and subsequent parcelization of the 579-acre installation property determined that approximately 373 acres of the facility fall within the CERFA parcel category. The larger CERFA parcel (12P) comprises 371 acres and stretches across the entire WRF peninsula. The smaller CERFA parcel (13P) comprises only 2 acres and is located in the southwest corner of the property.

Areas of the facility that had no evidence of such release, disposal, or storage, but contained hazards, such as asbestos, radon gas, lead-based paint, unexploded ordnance, radionuclides, or not in-use polychlorinated biphenyl (PCB)-containing equipment, should be categorized as CERFA parcels with qualifiers. No acreage on the facility was identified as a CERFA parcel with qualifiers.

Areas of the facility for which there is a history of release, disposal, or storage for one year or more of CERCLA-regulated hazardous substances or petroleum products were categorized as CERFA disqualified parcels. Approximately 206 acres of installation property are identified as CERFA disqualified parcels.

No facility acreage was identified as a CERFA excluded parcel.

Table of Contents

Appendices

List of Figures

List of Tables

List of Acronyms and Abbreviations

ACM	Asbestos-containing material
ADL	Arthur D. Little, Inc.
AREE	Area requiring environmental evaluation
ARL	Army Research Laboratory
AST	Aboveground storage tank
ATS	Army transmitting station
BRAC	Base Realignment and Closure
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CERFA	Community Environmental Response Facilitation Act
CONUS	Continental United States
CZM-BI	Coastal Zone Management - Bioaccumulation Study
DEQ	Department of Environmental Quality
DNA	Defense Nuclear Agency
EMP	Electromagnetic pulse
EPA	U.S. Environmental Protection Agency
ERNS	Emergency Response Notification System
FS	Feasibility study
FWS	U.S. Fish and Wildlife Service
GIS	Geographical Information System
IRP	Installation Restoration Program
kg	Kilogram
LUST	Leaking underground storage tank
MERDEC	U.S. Army Mobility Equipment Research and Development Center
NEPA	National Environmental Policy Act
NPL	National Priorities List
PA	Preliminary assessment
PCB	Polychlorinated biphenyl
ppb	Parts per billion
ppm	Parts per million
RCRA	Resource Conservation and Recovery Act
RCRIS	Resource Conservation and Recovery Information System
RI	Remedial investigation
TAL	Target analyte list
TPH	Total petroleum hydrocarbons
USAEC	U.S. Army Environmental Center
USAECFB	U.S. Army Engineer Center and Fort Belvoir
USAEHA	U.S. Army Environmental Hygiene Agency
USATHAMA	U.S. Army Toxic and Hazardous Materials Agency
UST	Underground storage tank
UXO	Unexploded ordnance

List of Acronyms and Abbreviations

VEPCO	Virginia Power and Electric Company
VOC	Volatile organic compound
VWCB	Virginia Water Control Board
WRF	Woodbridge Research Facility

CERFA-Specific Acronyms

P	CERFA Parcel
E	CERFA Excluded Parcel
D	CERFA Disqualified Parcel
HR	Hazardous substance disposal or release
HS	Hazardous substance storage
PR	Petroleum disposal or release
PS	Petroleum storage
Q	CERFA Qualified Parcel
A	Asbestos
L	Lead-based paint
P	PCBs
(P)	Probable
R	Radon
RD	Radionuclides
X	Unexploded ordnance

This report presents the results of the Community Environmental Response Facilitation Act (CERFA) investigation conducted by Arthur D. Little, Inc. at Woodbridge Research Facility (WRF), a U.S. Government property selected for closure by the Base Realignment and Closure (BRAC) Commission under Public Laws 100-526 and 101-510. The primary objective of this investigation as required under CERFA (Public Law 102-426), is for Federal agencies to expeditiously identify real property offering the greatest opportunity for immediate reuse and redevelopment. Satisfying this objective requires the identification of real property where no Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)-regulated hazardous substances or petroleum or their derivatives were stored for one year or more, known to have been released, or disposed of.

The property examined under this investigation is a 579-acre site located in Woodbridge County, Virginia, approximately 2 miles west of downtown Alexandria, Virginia. The installation's primary mission is to conduct electromagnetic pulse (EMP) research and testing and, more specifically, to investigate and study the effects of EMP produced by exo-atmosphere nuclear weapons detonation on communications and other military systems.

Arthur D. Little reviewed existing investigation documents, U.S. Environmental Protection Agency (EPA), state, and county regulatory records, environmental data bases, and title documents pertaining to WRF during this investigation. In addition, Arthur D. Little conducted interviews and visual inspections of the facility as well as visual inspections and data base searches for the surrounding properties. This information was used to divide the installation into four categories of parcels: CERFA parcels, CERFA parcels with qualifiers, CERFA disqualified parcels, and CERFA excluded parcels.

Areas of the facility that have no history of hazardous substance or petroleum product release, disposal, or storage are categorized as CERFA parcels. Arthur D. Little's investigation and subsequent parcelization of the 579-acre installation property determined that approximately 373 acres of the facility fall within the CERFA parcel category. The larger CERFA parcel (12P) comprises 371 acres and stretches across the entire WRF peninsula. The smaller CERFA parcel (13P) comprises only 2 acres and is located in the southwest corner of the property.

Areas of the facility that had no evidence of such release, disposal, or storage, but contained hazards, such as asbestos, radon gas, lead-based paint, unexploded ordnance, radionuclides, or not in-use polychlorinated biphenyl (PCB)-containing equipment, should be categorized as CERFA parcels with qualifiers. No acreage on the facility was identified as a CERFA parcel with qualifiers.

Areas of the facility for which there is a history of release, disposal, or storage for one year or more of CERCLA-regulated hazardous substances or petroleum products were categorized as CERFA disqualified parcels. Approximately 206 acres of installation property are identified as CERFA disqualified parcels.

No facility acreage was identified as a CERFA excluded parcel.

The accompanying map summarizes the categorization of WRF based on the above definitions. The CERFA report for this installation provides the relevant environmental history to substantiate the parcel categorization.

This CERFA Report has been reviewed by the U.S. Army Environmental Center (USAEC), Woodbridge Installation, Region III Environmental Protection Agency, and the Virginia State Department of Environment Quality. Comments from these organizations have been incorporated into this final report. Any unresolved issues from the regulatory agencies have been incorporated in Appendix C of this document.

The primary objective of CERFA is satisfied by the identification of CERFA parcels and CERFA parcels with qualifiers. As a result, concurrence has been sought from the regulatory agencies on these two categories of parcels. Concurrence has been received for Parcels 12P and 13P.

This report does not address other property transfer requirements that may be applicable under the National Environmental Policy Act (NEPA), nor does it address natural resource considerations such as endangered, rare, or threatened plant or animal life.

This report is based primarily upon the environmental conditions observed at WRF during August 1993. Past site conditions and management practices were evaluated, based on available regulatory records, on-site records, and the recollections of people interviewed during August and September 1993. After undergoing both a regulatory and a USAEC review, this report was subsequently updated to include some recent information through March 1994. This information includes: Virginia Department of Environmental Quality (DEQ) sampling information, details from the Draft Preliminary Site Inspection Report, and a records search of the state's DEQ solid waste, hazardous waste, and Superfund files. It should be noted, however, that the most recent information regarding current site conditions, ongoing remediation and site inspections is provided in two reports whose release are currently pending: *The Preliminary Site Inspection Report* by Earth Technology Corporation, and *The Final Work Plan* (March, 1994) by Earth Technology Corporation.

1.0 Introduction

1.1 Purpose and Scope

Public Laws 100-526 and 101-510 designated more than 100 Department of the Army facilities for closure and realignment. As a result, it became necessary to expedite the environmental investigation and cleanup process, as necessary, prior to the release and reuse of Army Base Realignment and Closure (BRAC) property. The BRAC environmental restoration program was established in 1989 with the first round (BRAC 88) of base closures and continued with subsequent rounds (BRAC 91 and BRAC 93). The BRAC program is patterned after the Army's Installation Restoration Program (IRP), except that it has been expanded to include such categories of contamination as asbestos, radon, polychlorinated biphenyls (PCBs), and others that are not normally addressed under the Army IRP.

The BRAC environmental restoration program began by conducting enhanced preliminary assessments (PAs). The term "enhanced" is used to distinguish these assessments from previous IRP preliminary assessments, since the BRAC PAs are conducted from a property transfer perspective and evaluate areas that are not included in the IRP (e.g., asbestos, radon, PCBs). The enhanced PAs include reviews of existing installation documents, regulatory records, and aerial photographs; a site visit and visual inspection; and employee interviews. Enhanced PAs were conducted for BRAC 88 and BRAC 91 installations, and are currently under way at BRAC 93 installations. An Enhanced PA was prepared for the WRF in March 1992 by Roy F. Weston, Inc., under the direction of the U.S. Army Environmental Center (USAEC) (formerly the U.S. Army Toxic and Hazardous Materials Agency [USATHAMA]).

In October 1992, Public Law 102-426, the Community Environmental Response Facilitation Act (CERFA) amended Section 120(h) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and established new requirements with respect to contamination assessment, cleanup, and regulatory agency notification/concurrence for federal facility closures. CERFA requires the federal government, before termination of federal activities on real property owned, to identify property where no hazardous substances were stored, released, or disposed of. Also, the designation must be concurred with by the appropriate regulatory agency (U.S. Army Environmental Protection Agency (EPA) on National Priorities List (NPL) bases and the state agency on non-NPL bases). These requirements retroactively affect the Army BRAC 88 and BRAC 91 environmental restoration activities, and are being implemented at BRAC 93 sites concurrently with their enhanced PAs. The primary CERFA objective is for federal agencies to expeditiously identify real property offering the greatest opportunity for immediate reuse and redevelopment. Although CERFA does not mandate the Army transfer real property so identified, the first step in satisfying the objective is the requirement to identify real property where no CERCLA-regulated hazardous substances or petroleum products were stored, released, or disposed of.

1.0 Introduction

Arthur D. Little was awarded the task to identify real property where no CERCLA-regulated hazardous substances or petroleum products were stored, released, or disposed of at five BRAC 91 sites. Under this task, a work plan was developed to describe the process in satisfying the CERFA task objective. The purpose of this report is to present the findings for the U.S. Army Research Laboratory, Woodbridge Research Facility, Woodbridge, Virginia.

1.2 Definition of Terms

The following definitions are used to categorize and label parcels identified on the installation:

- CERFA parcel - A portion of the installation real property for which investigation revealed no evidence of storage for one year or more, release, or disposal of CERCLA hazardous substances, petroleum, or petroleum derivatives and no evidence of being threatened by migration of such substances. CERFA parcels include areas where PCB-containing equipment is in operation, but there is no evidence of release. CERFA parcels also include any portion of the installation that once contained related environmental, hazard, or safety issues including unexploded ordnance (UXO) located on firing ranges or impact areas, radon, stored (not in use) PCB-containing equipment, products that contained radionuclides being used for their intended purposes, asbestos contained within building materials, and lead-based paint applied to building material surfaces, but that has since been removed or fully remediated.

- CERFA parcel with qualifier(s) - A portion of the installation real property for which investigation reveals no evidence of storage for one year or more, release, or disposal of CERCLA hazardous substances, petroleum, or petroleum derivatives and no evidence of being threatened by migration of such substances. The parcel does however contain related environmental, hazard, or safety issues, including UXO located on firing ranges or impact areas, radon, radionuclides contained within products being used for their intended purposes, asbestos contained within building materials, lead-based paint applied to building material surfaces, or stored (not in use) PCB-containing equipment.

- CERFA disqualified parcel - A portion of the installation real property for which investigation reveals evidence of a release, disposal, or storage for more than one year of a CERCLA hazardous substance, petroleum, or petroleum derivative; or a portion of the installation threatened by such a release or disposal. CERFA disqualified parcels also include any portion of the installation where PCBs, asbestos-containing material (ACM), lead-based paint residue, or any ordnance has been disposed of, and any locations where chemical ordnance has been stored. Additionally, CERFA disqualified parcels include any areas in which

CERCLA hazardous substances or petroleum products have been released or disposed of and subsequently fully remediated.

- CERFA excluded parcel - A portion of the installation real property retained by the Department of Defense, and therefore not explicitly investigated for CERFA. CERFA excluded parcels also include any portions of the installation that have already been transferred by deed to a party outside the federal government, or by transfer assembly to another federal agency.

1.3 Geographical and Environmental Setting

WRF is located in the eastern most portion of Prince William County in Woodbridge, Virginia and has a total area of 579 acres. Prince William County is located in northern Virginia and contains a total land area of 355 square miles. The county's population, according to a 1991 estimate, is 219,033. WRF is located less than 1.5 miles east of downtown Woodbridge and 22 miles southeast of Washington, D.C.

The town of Woodbridge has a population of 30,860 (1991 estimate). U.S. Census Bureau Tract No. 9001.00, which encompasses WRF and the land immediately adjacent to the facility, contains an estimated 1,216 residents (1991). This tract is generally bounded by the RF&P railroad tracks on the west.

There is a diversity of land use and employment types throughout the county. Over 50 percent of the land in the county is zoned for agricultural use, although most of it is located in the western part of the county.

Since the Enhanced PA (March, 1992) zoning has changed slightly in the area. A pending application by K C Belmont Bay LP requests to rezone the property north of WRF. According to the County Assessor's office, KC Belmont Bay LP owns a 187.08-acre tract and a 78.48-acre tract and has applied for rezoning from an agricultural, residential, general business, and mixed heavy industrial use to "PMD" or planned mixed development. It is believed that the developers will turn this property into a single and multi-family housing development with a golf course. No construction or ground breaking activities have occurred at the time of the CERFA assessment.

Generally, the land immediately adjacent to WRF is zoned either residential or heavy industrial to the north and residential or agricultural to the west and southwest around Marumsco Creek. More specifically, to the north of the facility and east of Dawson Beach Road lies residential property zoned either R-10 (Suburban Residential), R-T (Residential Townhouse), or RM-1 (Residential Multi-family). However, a large plot at the end of Taylor's Point Road, believed to be a private residence, is zoned M-1 (Heavy industrial use) according to the 1988 Prince William County Zoning Map. (Prince William County, 1988)

1.0 Introduction

To the west of Dawson Beach Road lies a heavily industrialized area. In the northwest corner of the facility site are nine military family housing units, administered by the U.S. Army Engineer Center and Fort Belvoir, (USAECFB), Fort Belvoir, Virginia.

To the west, the facility is bounded by Marumsco Creek and the Marumsco National Wildlife Refuge tidal wetlands. West of Marumsco Creek is Veteran's Memorial Park, a recreation area administered by Prince William County.

The climate at WRF is variable, influenced by Chesapeake Bay and the Atlantic Ocean to the east and the Appalachian Mountains to the west. Under Koeppen classifications, the summers are characterized by maritime-tropical winds from the south and southwest, which bring warm, often humid air to the region. High-pressure systems often stagnate over the area, creating occasional air pollution episodes during the summer. Winter is characterized by cold, dry continental-polar winds from the west and northwest.

The annual mean daily temperature for the area is 57°F. The monthly mean temperatures for the area range from an average high of 90°F in July to an average low of 29°F in January. The recorded high temperature was 106°F in July 1930, and a low of -15°F was recorded in February 1899. The growing season, based on average first and last killing frosts, is from April 15 to October 15.

The average annual precipitation is 38.88 inches. Snowfall averages less than 10 inches per year. The maximum recorded snowfall of 25 inches fell in January 1922, according to the Natural Resource Management Plan (compilation of Woodbridge Facility documents, 1991).

The winds are generally out the south in the summer months and the north to northwest in the winter months. The average wind speed is 7.1 mph. The prevailing southerly flow associated with the Gulf Stream during the summer months often increases the potential for late afternoon/evening thunderstorms, which provide much of the precipitation during this period.

WRF is located on a neck of land at the southern edge of the embayed mouth of the Occoquan River, where it empties to Belmont Bay and Occoquan Bay, which feeds the Potomac River and the Chesapeake Bay. Physiographically, the facility lies in the western or inner part of the Coastal Plain Province, less than 5 km to the east of the Piedmont Province. The southern portion of the facility is marsh, underlain by alluvium from Potomac River and Occoquan River terrace deposits, while the northern portion of the facility is situated on a slightly higher, post-Pleistocene terrace of the Potomac.

1.0 Introduction

The facility is located in the drainage basin of the Occoquan Watershed and is composed primarily of terrace and alluvial deposits from this and the ancestral Potomac River. The cobbles and gravels originate from the ancestral Potomac and include a variety of cherts, jasper, quartzite, rhyolite, silicified sandstone, and quartz. Tributary streams such as the Occoquan River and Marumsco Creek also carry this material as they cut through the various cobble deposits, quartz float, and veins of the adjacent Piedmont. Some large cobbles and bou[illegible] possibly originated from ice rafting mechanisms associated with the late San[illegible]n glaciation.

The primary surface water sources presently affecting WRF are the Occoquan River to the north and Marumsco Creek to the south. The facility is also bisected by an unnamed creek originating from residential and partly industrialized areas to the north. The creek flows around the main compound and is fed by several smaller drainage lines before eventually feeding Belmont Bay. Several additional drainage courses are also found on the property.

According to the USDA Soil Survey for Prince William County, issued in August 1989, the general soil association found in the eastern Woodbridge vicinity is the Dumfries-Lunt-Marr soil association. Dumfries soils are on strong sloping to very steep side slopes. They are well drained and very deep and have a loamy subsoil. Lunt soils are on gently sloping to moderately steep side slopes and are well drained, very deep, and have a loamy subsoil. Marr soils are on strongly sloping to moderately steep slopes, are very deep and well drained, and have a high content of fine sand and very fine sand. The upper surficial sediments include terrace and alluvial deposits of Pleistocene and Holocene (recent) ages.

Ground water availability in the Coastal Plain sediments is generally good, although the limited areal extent and relative thinness of the sediments in Prince William County restrict the amount that can be developed.

Approximately 150 acres of WRF are classified as wetlands on tidally influenced marshes or swamps (NRMP, 1991). The wetlands are diverse and support a wide variety of wildlife. Dominant wetland plants include:

- Broad-leaved Cattails (Typha latifolia)
- Pickerelweed (Pontederia cordata)
- Wild Rice (Zizania aquatica)
- Arrowarum (Peltandra virginica)
- Sword Grass (Scirpus americanus)
- Red Maple (Acer rubrum)
- Silver Maple (Acer saccharinum)
- Red Cedar (Juniperus virginiana)
- White Willow (Salix)
- Burr Reed (Sparganium eurycarpum)
- Yellow Pond Lily (Nuphan variegatum)

WRF is bordered on the west by Marumsco National Wildlife Refuge, a large wetland system managed by the U.S. Fish and Wildlife Service (FWS) that serves as a feeding and nesting area for many species of waterfowl, including herons, black ducks, and wood ducks. These same species occur and perhaps nest at WRF. From a joint program with the FWS and the Army Materiel Laboratory, a list has been developed of birds and other wildlife that have been sighted at WRF and Marumsco National Wildlife Refuge. WRF is a rich area of waterfowl and other wildlife.

WRF contains a great diversity of habitat types and resultant edge habitats. Habitat types include floodplain and upland forests, tidal marsh, wooded swamp, shrubland, open water, and disturbed habitat (mowed fields). The Marumsco National Wildlife Refuge is a large palustrine marsh system.

A fence around the installation controls immigration and emigration of large species (primarily white-tailed deer). The primary activities affecting populations at WRF are deer hunting, fishing, and pond stocking. Deer hunting had been discontinued for several years, resulting in a large population increase. Hunting has been reinstituted and will be used as necessary to control the deer population.

Other species are limited by food resources and other habitat considerations and by predation, mainly from birds of prey and foxes.

According to the Natural Resource Management Plan (NRMP, 1991), largemouth bass, bluegill, gizzard shad, white perch, American eel, and perhaps channel catfish inhabit a 2-acre pond at WRF. An Inter-Service Support Agreement (ISSA) has been implemented between WRF and the FWS, Office of Fishery Assistance (NRMP, 1991).

The natural fish population in the pond remains relatively stable, with fishing pressure an extremely minimal factor in control. Habitat, size of the pond, and food availability are the limiting factors for the fish population.

Habitat for the bald eagle is present on the facility, although no nests have been documented. Bald eagles use the site as a resting and feeding area. The most commonly used areas are along Belmont Bay from the old Belvoir Bridge to the picnic ground.

A literature review from Virginia Natural Heritage Program determined the presence of endangered or threatened species that occur or may occur at WRF. These species are listed in Table 1-1.

A review of available information sources pertaining to the prehistoric and historic archeology of WRF was conducted (Roy F. Weston, 1992). The review indicated that three prehistoric and three historic sites are known to exist on WRF property. Specific potential archeological historic artifacts were also reported. These include

artifact scatters, a historic fisheries facility, a colonial cemetery, a historic ferry landing, and a prehistoric lithic scatter for which exact location data are unavailable. The physical integrity of the known and potential sites is unknown. Only a portion of these sites are believed to possess sufficient significance to be potentially eligible for the National Register of Historic Places (NRHP, 1991). Because WRF occupies one of the few relatively undisturbed locations in the area, the potential significance of its archeological remains is considered to be of a high order.

Table 1-1: Endangered or Threatened Species That Occur or May Occur at Woodbridge Research Facility

Common Name	Scientific Name	Status
River Otter	*Lutra canadensis lataxina*	Endangered
Canadian Beaver	*Caster canadenses canadensis*	Extirpated
Loggerhead Turtle	*Caretta caretta*	Endangered
Bald Eagle	*Haliaeetus leucocephalus*	Endangered
Sharp-shinned Hawk	*Accipiter straitus*	Threatened
American Kestrel	*Falco sparverius*	Threatened
Bewick's Wren	*Thryomanes bewickii*	Threatened
Loggerhead Shrike	*Lanius ludovicianus*	Threatened
Henslow's Sparrow	*Paserherbulus henslowii*	Threatened
Osprey	*Pandion haliaetus*	Threatened
Striped Bass	*Morone saxitilis*	Threatened

2.0 Scope of Investigation

Arthur D. Little's investigation of WRF is primarily based upon three site visits during August 1993, various interviews with installation personnel, USAEC personnel, Army Research Laboratory (ARL) personnel, and local, state, and federal regulators (see Section 2.3, Interview List), and reviews of reports and maps (see Section 2.1, Existing Investigation Documents).

Harold Allen, Installation Maintenance Supervisor, and Todd Waltemeyer, BRAC Transition Coordinator, provided most of the site-specific information. Mr. Allen has worked at the facility for over 30 years and retains a remarkable memory of old construction and project details. This proved to be very useful since much of the historical details of the site remains undocumented. It is also possible that some of this information is now lost or became inaccessible after control of the site transferred from the U.S. Army Strategic Communications Command, CONUS to the Woodbridge Research Facility in 1970. In addition to ARL and USAEC personnel, Kevin McCreanor, senior geologist at Earth Technology Corporation, provided updated information regarding the site inspection survey and sampling activities that were conducted concurrently with and continued after the CERFA field investigation.

2.1 Existing Investigation Documents

Existing investigation documents included a series of installation maps dating back to the early 1960s. Older maps, which are currently stored in a drafting storage room at the ARL in Adelphi, Maryland, documented old storage tank sites, as well as the location of transite pipes (an asbestos-containing cement material), underground cables, former and current transformer sites, surface water runoff features, hazardous waste storage areas, old communication and antennae networks, and a general sense of previous site conditions. Other types of maps provided more general information such as topography and general use and zoning information.

The Enhanced PA (Roy F. Weston, 1992) provided the most information for this CERFA assessment. Other documents that provided additional data included:

The Earth Technology Corporation, 1993. *Preliminary Site Inspection Report.* (Draft Copy). Prepared for the U.S. Army Environmental Center. (Note: this document has not been released yet and the title is subject to change).

The Earth Technology Corporation, 1993. *Draft Final Work Plan: Woodbridge Research Facility, Virginia.* Prepared for the U.S. Army Environmental Center.

Environmental Monitoring Systems Laboratory - USEPA Region III. 1991. *Installation Assessment Army Base Closure Program: Woodbridge Research Facility, Woodbridge, Virginia.* Prepared for USATHAMA (includes aerial photographs).

Environmental Science and Engineering, 1981. *Installation Assessment of ERADCOM Activities: Harry Diamond Laboratories, Maryland; Woodbridge Research Facility, Virginia; Report No. 309A.* Prepared for the U.S. Army Toxic and Hazardous Materials Agency.

Virginia Department of Environmental Quality. May 11, 1993. Federal Facilities Program, Quarterly Report: *Site Visit Report: Woodbridge Research Facility.*

Roy F. Weston, 1992. *Enhanced Preliminary Assessment: Woodbridge Research Facility, Virginia.* Prepared for the U.S. Army Toxic and Hazardous Materials Agency.

Maps Reviewed

Woodbridge Research Facility; *General Heating Plan.*

U.S. Army Materiel Command, Harry Diamond Laboratories, *General Signal Communication Plan.*

U.S. Army Transmitting Station, 1961. *Composite of Topography* (includes antennae network).

Corps of Engineers; Baltimore, MD, September 30, 1977. *General Electrical Plan.*

Corps of Engineers; Baltimore, MD, March 1991. *Electrical - Existing Conditions.*

U.S. Army Adelphi Laboratory Center; Woodbridge Research Facility, March 1991. *Water - Existing Conditions.*

U.S. Army Adelphi Laboratory Center; Woodbridge Research Facility, March 1991. *Wastewater - Existing Conditions.*

U.S. Army Adelphi Laboratory Center; Woodbridge Research Facility, March 1991. *Telecommunications - Existing Conditions.*

U.S. Army Adelphi Laboratory Center; Woodbridge Research Facility, March 1991. *Installation Land Use - Existing Conditions.*

U.S. Army Adelphi Laboratory Center; Woodbridge Research Facility, March 1991. *Development Constraints - Existing Conditions.*

U.S. Army Adelphi Laboratory Center; Woodbridge Research Facility, March 1991. *Storm Drainage - Existing Conditions.*

Prince William County. July 1988. Generalized Zoning Map.

Prince William County. July 1987. General Use and Economic Development Map.

2.2 Federal, State, and Local Records Review

Federal and state records (see Appendix B-1) for both the installation and adjacent property included a database search (on September 16, 1993) within 1-mile of the property for:

Federal Data Search
- National Priorities List Superfund sites
- EPA CERCLIS sites
- ERNS spills
- RCRA Corrective Action
- RCRA Subtitle D landfills
- FINDS facilities

State Data Search
- State landfills
- Leaking underground storage tanks (USTs)

In addition to the September 1993 records search, an additional records search was conducted on April 6, 1994 to update the previous records search and to provide specific state records. This records search was conducted by Virginia's DEQ - Phase I Real Estate Investment Division (I-28; See Appendix B-2). The state search of computerized files included:

- State Landfills
- Superfund
- Hazardous Waste
- Current investigation data files

An additional records search was requested to provide Virginia DEQ information regarding state USTs, aboveground storage tanks (ASTs), and spills. Based upon a discussion with a permit writer and geologist supervisor (I-27) it was determined that the existing records search, as included in Appendix B-1 was adequate.

National Priorities List Superfund Sites
NPL sites are those sites that are determined by EPA to pose an immediate public health hazard and immediate cleanup response is necessary. No NPL sites were found within a 1-mile radius of WRF.

CERCLA Sites

EPA's Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) database tracks sites found on the CERCLA data system. These sites are usually abandoned or inactive hazardous waste sites that are being reviewed to determine the extent of public hazard.

Both the September 1993 and April 1994 records search found one listing within 1-mile of WRF: United Fiberglass Inc. The site, a closed fiberglass manufacturing site, is located almost 1 mile southwest of WRF. This site is not expected to influence WRF since the ground water and surface waters appear to flow directly into the Occoquan Bay.

ERNS Spills

EPA maintains the Emergency Response Notification System (ERNS), which is the information repository housing information on hazardous spills nationwide. This information is based on reports filed by local agencies such as fire and police; county agencies; state entities; and federal agencies such as the Coast Guard, the National Response Center, and the EPA as well.

Four ERNS reports were located within a 1-mile radius of the site. They are listed below in chronological order:

An oil spill located on the Occoquan River east of WRF occurred on February 20, 1987. The amount of the spill and the exact origin are unknown, although the report indicated that the spill was sighted from the Route 1 bridge and the spill was "possibly coming from the marina."

A lime slurry of unknown amount was dumped into a pit "until being picked up." The April 5, 1988 report does not list the responsible party, although the site is located over half a mile northwest of WRF.

A 4,500-gallon gasoline spill occurred on December 19, 1989. The potentially responsible party was listed as the Woodbridge Mobil Station. The gasoline spill entered an unnamed stream, which emptied into the Occoquan River. The gas station is located at least three quarters of a mile from the WRF installation.

On March 7, 1990, a private homeowner three quarters of a mile east of WRF reported that his property was saturated with oil. The potential responsible party was listed as an "unknown occupant."

RCRA Notifier Facility Report

The source of this data is the EPA Resource Conservation and Recovery Information System (RCRIS) computer system. These facilities have been permitted to handle hazardous waste as defined in the Resource Conservation and Recovery Act (RCRA). Large quantity generators generate over 1,000 kg hazardous waste/month, or greater

than 1 kg acutely hazardous waste as defined by RCRA. Small quantity generators generate more than 100 and less than 1,000 kg of hazardous waste during any calendar month.

Several different types of businesses exist along Route 1. Most of the RCRA notifier facilities are dry cleaning establishments, auto or body shops, or service stations. Most of the listed facilities are small quantity generators. Six large quantity generators were located within a 1-mile radius. The two closest to WRF are:

Lustine Toyota
14227 Jefferson Davis Highway (Route 1)

Sunoco Service Station
13731 Jefferson Davis Highway

Leaking USTs and State Spill Reports

The database search identified over 33 leaking USTs (LUSTs) or spills within a 1-mile search radius, three of which are on site. The majority of LUSTs and spills were associated with gas stations located along the main highway (Route 1), located half a mile northwest of the site.

Three state UST/spill reports were found on the Woodbridge site. On-site spills and USTs are discussed in Section 4.1.1 of this report (see UST Leaks and Spills and Former Underground Storage Tanks).

The closest reported off-site spill occurred on May 11, 1989, when an unspecified volume of wash water was released at a precast manufacturing plant. The responsible party was listed as Arban and Carosi, which is located less than 400 feet from the Dawson Beach Road entrance to WRF. The safety director at Arban and Carosi (I-21 of Table 2-1, Woodbridge Interview List) was not familiar with this occurrence. She believes that the wash water may have originated from either the pressure washer for vehicles or the pressure washer for the precast cement material on site. The pressure washer for the precast cement uses muriatic acid in the wash mix. The safety director also added that she could not remember any chemical spills during her eight years of employment at the plant. In a later interview, the owner of Arban and Carosi confirmed that no hazardous substances are used in their wash water.

State Solid Waste Sites

The Virginia DEQ records search on April 6, 1994 revealed that 13 landfills exist within the city of Woodbridge or Prince William County. These landfill sites, however, do not appear to be close enough to the WRF property to influence environmental conditions on site (see Appendix B-2).

Incident Reports - Virginia DEQ
These incident reports include citizen complaints, solid or hazardous waste mismanagement, or major spills. The April 6, 1994 records search did not uncover any "incidents" from adjacent properties (see Appendix B-2).

2.3 Interviews

Installation personnel were interviewed to determine any changes to the environmental conditions of the installation or additional areas requiring environmental evaluation (AREEs) since the Enhanced PA was conducted in November 1991. A listing of the people interviewed is provided in Table 2-1.

2.4 Visual Inspections

Visual inspection of the site included an overview driving tour on August 10, 1993. Visual inspections also included walking tours of the compound area and the landfill areas and spill areas. The site perimeter is bordered by a road. This road provided a good overview of the coastal perimeter of the site. For this reason, a boat tour was not necessary. A later offroad tour on August 27, 1993, in a four wheel drive truck provided additional access to less accessible road areas around the north and western areas of the site. Additional inspections of AREEs and miscellaneous areas throughout the property were conducted in conjunction with the four wheel drive tour.

2.5 Title Documents

Arthur D. Little conducted a review of tract maps and transfer documents to identify the prior property owners of the BRAC portion of WRF at the time of its transfer to the Army. The purpose of this review was to collect additional information concerning the property's prior use and environmental condition at the time of its transfer to the Army. Based on this review, no additional information was collected. Previous ownership and the dates of transfer to the Army are indicated on Figure 5-2.

Table 2-1: Woodbridge Research Facility Interview List

Interview Number	Date	Name	Organization	Title
I-1	8/10/93	Scott Hill	USAEC	USAEC Project Officer
I-2	8/10/93	Bob Craig	ARL - Risk Management	Environmental Engineer
I-3	8/10/93	Todd Waltemeyer	DOD	Base Transition Coordinator
I-4	8/19/93	Clerks	Prince William County County Assessors and Mapping Office	Clerks
I-5	8/20/93	Harold Allen	ARL-WRF	Facilities Manager
I-6	8/24/93	Robert Wardwell	ARL	Management Agronomist
I-7	8/24/93	Judy Brackin	ARL	Draftsperson
I-8	8/25/93	John Feustle	ARL-Risk Management Division	Environmental Engineer
I-9	8/25/93	Diana and other clerks in county mapping office	County Assessors Office Prince William County	Clerks
I-10	8/26/93	Lenny Longchamps	ARL-Facility Engineering Office	Foreman of Electronics
I-11	8/26/93	Erica Dameron	Virginia DEQ-Federal Facilities Program	Remedial Project Engineer
I-12	8/27/93	Todd Waltemeyer	DOD	Base Transition Coordinator
I-13	8/27/93	Harold Allen	ARL-WRF	Facilities Manager
I-14	8/30/93	Richard Meyers	CP Corporation	Sales Engineer
I-15	8/30/93	Amie Vitoles	ABB Corporation	Sales Engineer
I-16	8/30/93	Karen Durose	GE Company	Sales Engineer
I-17	9/22/93	Rodney Blevins	VEPCO	Reg. Ops. Sup.
I-18	9/26/93	David Grimes	Virginia DEQ-Federal Facility Program	Project Engineer
I-19	9/28/93	Bill Markland	ARL	BRAC Team Member
I-20	9/28/93	Harold Allen	ARL-WRF	Facilities Manager
I-21	9/29/93	Selina Hill	Arban and Carosi	Safety Manager
I-22	9/29/93	Todd Waltemeyer	DOD	Base Transition Coordinator
I-23	9/29/93	RCRA Hotline	EPA	Regulatory Specialist
I-24	9/30/93	Nick Carosi	Arban and Carosi	Owner
I-25	9/30/93	Bob Craig	ARL	Risk Management
I-26	3/31/94 and 4/7/94	David Grimes	Virginia DEQ-Federal Facility Program	Env. Program Planner
I-27	4/1/94	Bill Von Till	Virginia DEQ-Permit Writer, UST, AST	Geologist Supervisor
I-28	4/1/94	Barry Wright	Virginia DEQ-State Solid & Hazardous Waste Data	Database Operator
I-29	4/6/94	Kevin McCreanor	Earth Technology Corp.	Senior Geologist

3.0 Property Background Information

3.1 General Description of Real Property and Operations

Current Operations
The current mission of WRF is to support the ARL in Adelphi, Maryland, in investigating nuclear weapons effects and Army systems survivability. Primary activities are performing electromagnetic effects testing to simulate nuclear detonation effects and miscellaneous testing of military equipment. These activities are supported by administrative and maintenance functions. WRF's current operation was consolidated under the ARL on October 1, 1992.

General Description
WRF occupies approximately 579 acres of land in the town of Woodbridge in Prince William County, Virginia. WRF is the former Strategic Communications Command radio transmitter site for the east coast.

The primary surface water sources presently affecting WRF are the Occoquan River to the north and Marumsco Creek to the south. The facility is also bisected by an unnamed creek originating from residential and partly industrialized areas to the north. The creek flows around the main compound and is fed by several smaller drainages before eventually feeding Belmont Bay. Several additional drainage courses are also found on the property.

WRF contains a wildlife sanctuary/open space area along the riverfront, three electromagnetic effects testing areas, a research/development and testing area, a central compound for research/development and administration, a recreation area at the northeast corner of the installation, and an open space buffer along the northern boundary of the facility. There are currently 12 buildings and 5 field test installations. No housing facilities are located on the site.

Fuel and other fluids are stored at WRF in both drums and USTs. Five landfills were operated at the southwestern boundary of the site over the years for disposal of debris. Additionally, there are two potential landfills within the same general area as the five known landfill sites. PCB-containing transformers and capacitors were found in 1984 during the excavation of Landfill 2.

Wastewater generated at the site consists primarily of sanitary wastewater. The wastewater is currently discharged to the Occoquan Woodbridge Sanitary District. Sewage from the main building complex flows by gravity to a small holding tank in Building 301. It is pumped from there to the municipal sanitary sewer line.

Areas of environmental concern include the landfills; spill and drainage areas; areas where toxic or hazardous materials and PCBs were used or stored; buried copper and lead wire antennas; and a buried intruder detection system composed of ethylene glycol-filled plastic pipes.

3.0 Property Background Information

Past Use

The history of WRF has been well documented. Historical records of the property dating back to the late 17th century indicate that the Mason family, one of the dominant families in the Woodbridge area, had large land holdings on both sides of the Occoquan, including Mason's Neck.

Martin Scarlet, another prominent 17th-century figure in the area, purchased approximately 700 acres, including the WRF site, in 1657 from Captain Edward Streator, and named it Deep Hole Point. The gravestones of Martin Scarlet and his son John still exist on the WRF grounds today. In 1765, the land was transferred to Colonel John Taylor, in whose name the property remained until the Civil War.

Following the American Revolution, the economy of the Woodbridge area began a slow decline. Several factors appear to have contributed to this, among them the reduction in soil fertility from continual tobacco crops and the silting-in of harbors due to stripping of surface cover and plowing techniques of the 17th and 18th centuries.

Fisheries, including one on the southern edge of the Woodbridge facility, were important economically and are located on Civil War-era maps.

The main road crossed Occoquan Creek at the village of Occoquan. This road replaced the earlier one, which crossed the ferry at Colchester. A ferry operated at times between Deep Hole Point and Sandy Point on the end of Mason's Neck. The Deep Hole farm and surrounding property was purchased by Colonel John Taylor in 1765 and held for close to a century.

During the Civil War, Confederate batteries were constructed in the vicinity of WRF. After the Civil War, and until the construction of the WRF, the primary land use on the facility appears to have been farming, especially on the northern half of the facility. Farm residences and outbuildings were present, and all the land on this portion of the facility was plowed. Because of the generally low elevation, erosion of the facility was minimal, with the exception of the western edge facing Marumsco Creek, and possibly the borders of a small drainage just north of the present main structures.

After the Civil War, Deep Hole farm was bought by the Metzeger family, who built a frame house there for their tenants.

In 1908, J. Lindsay Dawson of Fairfax County bought the farm with the Metzeger house intact, and the property was subsequently used for cattle raising and fisheries until 1951, when it was purchased by the government. The last remaining structure, the Dawson farmhouse, burned down in 1968. Building foundations still remain on the northern portion of the facility.

3.0 Property Background Information

In 1951, the Army acquired the fee-simple title to 649 acres of land in Woodbridge for use as military radio station. In 1952, the site was assigned to the U.S. Army Command and Administrative Communications Agency and designated as the Army Transmitting Station (ATS).

In 1962, ATS was redesignated the U.S. Army Continental United States (CONUS) Regional Communications Command, East Coast Radio Transmitting Station. In 1965, it was placed under the U.S. Army Strategic Communications Command, CONUS. Between July 1969 and July 1970, the station remained inactive; however, at the end of that period, 642 acres of the site was transferred to the U.S. Army Materiel Command. The suitability of its environment for electromagnetic pulse (EMP) testing and development led to its reassignment to the U.S. Army Mobility Equipment Research and Development Center (MERDC), Fort Belvoir, Virginia and its redesignation as WRF. Concurrent with these developments, 69 acres of WRF land reserved for housing was transferred to Fort Belvoir.

In July 1971, HDL, Adelphi, Maryland, acquired 642 acres of land and 49,678 square feet of permanent buildings at the WRF site as part of an Army consolidation effort involving nuclear weapons effects research and test activities. In September 1971, the Electromagnetic Effects Laboratory of Fort Belvoir was physically moved to WRF.

In December 1972, 63 acres of WRF land along Marumsco Creek was declared excess and, in 1973, was transferred to the U.S. Department of the Interior for use as a wildlife conservation area. In addition, approximately 7 acres of land northwest of the WRF property and adjacent to the WRF front gate area remained reserved for Fort Belvoir housing. WRF currently covers approximately 579 acres of land.

As a satellite installation of ARL, WRF's mission is to conduct EMP research and testing and, more specifically, to investigate and study the effects of EMP produced by exo-atmospheric nuclear weapons detonation on communications and other military systems. Testing is accomplished on site using four pulsers. Items tested at WRF have included the XMZ Track Vehicle, XMI Tank, Lance Missile, miscellaneous classified tanks, pacemakers, hearing aids, and commercial electronics equipment (e.g., TVs, radios, stereos) for the Defense Nuclear Agency (DNA).

3.2 Changes to Real Property Environmental Conditions Since Enhanced Preliminary Assessment (1991)

Few substantial changes have occurred at the WRF site since the Enhanced PA was conducted in September 1991. The installation, however, is preparing for site closure by properly disposing of flammable and hazardous wastes stored on site. The installation plans to vacate the site by October 1994. Installation equipment will be transferred to other Army test centers or properly disposed. The following changes have occurred since the Enhanced PA:

Batteries
Over 11,000 pounds of lithium batteries that were previously stored in metal "transportainers" at the southwest corner of the compound have been shipped off site. Currently, only one or two batteries are stored in the battery storage room in Building 211 (I-19, I-20).

Removal of Transformer
The PCB-containing transformer was removed in December 1992. The pad beneath the transformer was removed as well. This transformer was stored outside in a fenced yard northeast and adjacent to Building 201. Currently, only dry or mineral oil filled transformers currently remain on site (I-20; Map - General Electrical Plan, no date).

Spills
In June 1993, between 50 to 150 gallons of hydraulic oil was spilled from a crane at the staging area along Dawson Beach Road. Soil has been excavated and is covered with a polyethylene sheet. The installation is currently making arrangements to ship the soil off site (I-20).

The same crane was also responsible for another hydraulic oil spill north of Building 202 in 1990. Most of this oil went directly into the storm drain, which led out to the drainage ditch north of the compound area. Some of the oil may have flowed into the oil/water separator behind Building 202. A contractor completed removal of 900 gallons of liquids and solids from the oil/water separator in June 1993 (I-1, I-5). However, the fluid removed smelled more like diesel fuel, suggesting that the hydraulic oil may not have flowed into the separator.

Asbestos
The Enhanced PA does not mention that during the spring of 1991, the installation contracted with Wayne Installation for additional removal of asbestos from Buildings 201, 202, and 203.

Virginia Water Control Board Sampling
The Virginia Water Control Board (VWCB) conducted water sampling in March as part of the "Coastal Zone Management - Bioaccumulation Study" or "CZM-BI". Due to the high concentrations of PCBs, the WRF site became one of five sites involved in the Phase III study, which included water, sediment, soil, and tissue sampling.

The Phase II and III samples referred to below present only the highlights of the sample analysis. A complete report of VWCB's study has not been officially released until further review by the Virginia DEQ. A preliminary analysis suggests, however, that PCB contamination at WRF exists on and downgradient of landfill #1 (AREE 1) and near the oil/water separator culvert (AREE 11) which leads out to the drainage ditch north of the compound. Acreage containing AREE I and AREE 11 and acreage which may be influenced by these AREEs have been designated as CERFA disqualified parcels.

Landfill Area #1 (AREE 1)

Location: WRF03: along coastal perimeter south of Landfill #1

- Phase II (3/17/93); one water sample collected, tested 15 ppb.
- Phase III (5/10/93); 14 tissue samples; maximum concentration tested 1500 ppb.

Location: WRF04: Landfill #1.

- Phase III (5/10/93); eight soil samples collected, maximum concentration tested 1100 ppb.

Oil/Water Separator (AREE 11)

Location WRF08: samples from culvert leading to drainage ditch.

- Phase II (3/17/93); three water samples collected, maximum concentration tested 1.5 ppb.
- Phase III (5/10/93); four sediment samples, maximum concentration tested 96,000 ppb.

4.0 Investigation Results

4.1 Previously Identified Areas Requiring Environmental Evaluation

The Secretary of Defense identified WRF for closure under BRAC 91. An Enhanced PA of WRF was prepared in 1992 (Roy F. Weston, 1992) to identify and characterize all facilities, areas, and operations with respect to known or suspected releases of contaminants, to identify areas of contamination that may require immediate remedial action, and to identify areas that may require additional investigation. The ongoing site investigations at the installation are being accomplished under contract with Earth Technology Corporation.

The Enhanced PA (Roy F. Weston, 1992) identified 27 areas requiring environmental evaluation (AREEs). Recently completed and ongoing investigations of those areas have generated a number of environmental reports, which were reviewed.

4.1.1 1D-HR/HS/PR/PS: The Central Compound, Parking Lot, and Drainage Ditch

UST Leaks and Spills (AREE 8). The soil and ground water in the area east of Building 202 appear to have been contaminated with oil as a result of overfilling of USTs and/or LUSTs at that location. Reportedly, there were several oil spills around the three former 10,000-gallon USTs near the Maintenance Shop in the 1970s and early 1980s. These spills, which occurred during filling or transfer operations, may have involved up to several thousand gallons. The spills were contained with sand bags, and some soil may have been excavated and taken to Fort Belvoir.

In addition, three 10,000-gallon USTs (two fuel oil and one diesel fuel) were removed from this location. The two fuel oil tanks were removed in 1990, and the diesel fuel tank was removed in 1981. The fuel oil tanks were removed in accordance with recent UST regulations and require no further action. There are no records of sampling during the removal of the diesel fuel tank.

Probably as a result of these spills and leaks, oil has seeped into a 15-foot-deep sump pit in the southeast corner of the Maintenance Shop (Building 202). The sump pit collected oil-contaminated water after a precipitation event.

On-site sampling by Earth Technology occurred in September and October 1993. The Preliminary Site Inspection Report reveals that soil samples collected at AREE 8 contained a maximum of approximately 42 ppm total petroleum hydrocarbons (TPH). Moreover two trenches excavated to a depth of eight feet at the former UST sites uncovered "dark discolored soil with an odor" (I-29).

Site inspection activities conducted during Fall 1993 included ground water sampling, surface soil sampling, subsurface soil sampling, excavation, visual inspection and land surveying. The UST areas were also surveyed with magnetometers and ground penetrating radar to locate tanks. A water sample was also taken from the sump pit, which is referred to as the condensate return pit in the Preliminary Site Inspection Report.

Maintenance Shop (AREE 10). The activities performed in the Maintenance Shop (Building 202) are vehicle maintenance, carpentry, and minor electrical repairs. Containers of fresh oil, cleaning solvent, paint thinner, and battery acid are stored in this building. There are no drains to the outside. The electrical switch room has a 15-foot-deep pit for the condensate return tank that fills with water and oil after a rain. No sampling is recommended other than the condensate return tank pit sampling for TPH (Roy F. Weston, 1992).

Oil/Water Separators (AREE 11 AND 14). There are two oil/water separators at WRF, one near the Maintenance Shop (AREE 11) and one near Building 211 (AREE 14). These approximately 1,000-gallon concrete tanks discharge through pipes to nearby grassy areas. The only documented servicing of these tanks was at Building 202 in April and June 1983. The oil/water separator near the Maintenance Shop previously received drainage from the paved area and wash rack north of the building. All inlets were plugged several years ago. Vehicles are no longer washed on site. The separator near Building 211 receives drainage from inside Building 211. It is not believed that significant amounts of contaminated liquid have entered the separator from Building 211. The Enhanced PA recommended that both oil/water separators should be inspected for leaks and if leaks are found, a soil boring/monitoring well should be installed (Roy F. Weston, 1992).

(AREE 11)
During the site inspection (Fall 1993) surface water sampling, sediment sampling, soil sampling, geophysics, excavation, visual inspection, and land surveying were conducted at AREE 11 (north of Building 202, Maintenance Shop). Four trenches were excavated around each side of the separator. The draft site inspection report noted that the oil/water separator appeared to be leaking and the soil was discolored with a fuel odor. All three soil samples had detectable TPH and two of the three had significantly high concentrations (49,936.7 ppm maximum TPH). The sediment sample taken at the outfall, which eventually leads to the drainage ditch, had detectable concentrations of dichlorobenzene and trichlorobenzene as well as significantly high levels of PCB-1260 at approximately 1169 ppm (Earth Technology Corporation; Preliminary Site Inspection Report; November 1993).

In March 1993, the Virginia DEQ collected a water sample north of the oil/water separator culvert that leads to the drainage ditch. The PCB concentration from this sample was 1.5 ppb. In May 1993, Virginia DEQ collected four sediment samples and reported maximum PCB concentrations of 96,000 ppb. These sampling events will contribute to a study, which is not yet released, by the VWCB, *Coastal Zone Management - Bioaccumulation Initiative* (See Section 3.2).

(AREE 14)
During the site inspection (Fall 1993) surface water sampling, sediment sampling, soil sampling, geophysics, excavation, visual inspection, and land surveying were conducted at AREE 14 (Building 211). Four trenches were excavated around each

side of the separator. No leaks, odors, or vapors were discovered. One surface water sample and two sediment samples from the separator outfall were taken. Two sediment and two soil samples collected contained detectable concentrations of TPH (Earth Technology Corporation, 1993).

Drum Storage Area (AREE 12). Waste liquid and new product drums were stored on a paved area north of the Maintenance Shop (Building 202). There were generally five to seven drums stored in this area, which usually contained waste liquids such as motor oil, antifreeze, brake fluid, and cleaning solvent as well as new product. There are no curbs, and the Enhanced PA described the pavement and surrounding grounds as "stained" and "stressed."

The site inspection during the Fall 1993 indicated that both TPH and 2-butanone were detected in two soil samples collected from under the pavement. The TPH concentrations were approximately 40 ppm and 66 ppm (Earth Technology Corporation, 1993).

Acid Neutralization Tank (AREE 13). A 1,000-gallon concrete underground tank is used to collect and neutralize any acid spilled from the battery room in Building 211. The tank drains to the sanitary sewer. The Enhanced PA recommended, however, that the tank should be inspected for cracks or evidence of leaks and a soil boring should be taken to below the depth of the tank. Soil samples should be taken at 2-foot intervals and analyzed for pH to determine whether acid has been released from the tank (Roy F. Weston, 1992). According to site personnel (I-1, I-5), this tank has remained free of battery acid runoff.

The location was surveyed and no leaks or stains were noticed during the Fall 1993 site inspection. A soil sample was collected at a depth of 10 feet from the excavation to the west of the tank. The pH value of 6.5 was higher than the average soil background level of 5.8 (Earth Technology Corporation, 1993).

Transformers (AREE 15). All transformers at WRF have been tested for PCB and one was found to contain 56 percent PCB. The other seven transformers contained oil with less than 10 ppm of PCB. The one PCB-containing transformer was located near Building 201 on a fenced concrete pad. Attached to it was an electrical switch that contains 65 gallons of pyranol. The manufacturer said that this oil typically contains 50 to 60 percent PCB. A contractor was hired to remove the transformer and switch and replace them with new equipment in December 1992.

In addition to the seven transformers within the compound, three VEPCO-owned transformers near the front gate exploded and were removed in 1984 (see Section 4.2).

Asbestos (AREE 16) and New CERFA Assessment Areas. Although much of the known asbestos has been removed, a comprehensive asbestos survey has not been conducted. During the Enhanced PA, potential ACM was identified in floor tile, mastic, fire doors, and isolated sections of pipe insulation. The CERFA assessment uncovered additional asbestos containing materials after studying maps of underground pipes. Transite pipes under the central compound area are still in place. Transite is an asbestos-containing cement material.

The Enhanced PA recommended that an asbestos survey be conducted and samples collected as necessary.

Spill Areas (AREE 17) and New CERFA Assessment Areas. Several spills have occurred within the compound area. The enhanced PA identified two spills from a crane and bulldozer. For both spills the stained soil was excavated and subsequently taken off site for incineration. The CERFA assessment identified an additional crane oil spill in the parking lot area. Approximately 5 gallons of hydraulic oil leaked from an old crane parked in the lot. The spill was cleaned up with clay and absorbent material. Other more significant spills include those that occurred in the UST area (see UST Leaks and Spills - AREE 8). The CERFA assessment also identified an additional bulldozer spill in the grassy area southwest of the compound area.

The Enhanced PA did not recommend additional samples of the spill areas. On March 13, 1993, however, the VWCB sampled the area behind Building 202 at the culvert leading to the drainage ditch. The samples indicated trace levels of PCBs at 1.5 ppb. For this reason, additional samples should be taken to determine levels of PCBs and TPH in all identified spill areas.

Flammable/Battery Storage (AREE 18). A two-room concrete building was used to store flammable waste and vehicle batteries. The Enhanced PA noted that one room contained two 55-gallon drums, one containing waste oil and the other mixed xylenes. This room has a concrete floor with no drain and no curb at the door. The other room contains batteries. It has a safety shower and an uncurbed drain that is believed to drain to the surrounding grounds. Because the doors to the exterior do not have a curb, it is possible that there may have been releases from the building to the outside. Therefore, the Enhanced PA recommended that a surface soil sample should be taken at 0 to 6 inches outside each of the two doors and analyzed for target analyte list (TAL) metals, volatile organic compounds (VOCs), and base-neutral-acids (BNA) (Roy F. Weston, 1992).

During the site inspection three surface soil samples and one soil sample at the excavated outfall of the drain pipe were collected. Metals detected from these samples appear to be within the normal soil background concentration range (Earth Technology Corporation, 1993).

Thermal Battery Storage (AREE 19). Thermal batteries were stored in two metal transport containers ("transportainers") in a grassy area next to the flammable storage building. The active components of the batteries were sealed in metal cans and no leaks are known to have occurred. The batteries contained an electrolyte of lithium chloride and potassium chloride, a cathode of calcium chromate or potassium chromate, and an anode of solid calcium. The batteries were insulated with asbestos. Over 11,000 pounds of batteries were eventually transferred off site by August 1993. It remains unlikely that any releases occurred at this site. (I-5; Virginia DEQ 1993; Roy F. Weston, 1992).

Although there is no evidence that transportainers leaked, the Enhanced PA recommended that one soil sample should be taken beneath the containers at a depth of 0 to 6 inches and analyzed for TAL metals.

During the Fall 1993 site inspection, three surface soil samples and one soil sample at the excavated outfall of the drain pipe were collected. Metals detected from these samples appear to be within normal soil background concentration range (Earth Technology Corporation, 1993).

Former Incinerator (AREE 20). A small metal incinerator was used for burning classified documents from the 1950s until 1970 and was removed in 1972. The incinerator had asbestos-lined firewalls and a 100-gallon aboveground tank for heating oil that was used as a fire starter (Roy F. Weston, 1992). After the incinerator was dismantled, demolition debris -- including asbestos materials -- was disposed of in on-site landfills.

The Enhanced PA recommended six soil borings be taken to 2 feet. The soil should be visually analyzed for evidence that something other than paper was burned, such as pieces of metal, or for evidence of organic stains. If visual evidence is found of material other than paper ash, the soil sample should be analyzed for TAL metals.

During the site inspection magnetic and ground penetrating radar surveys were conducted to locate the area of the former incinerator. Nine test pits excavated to a depth of 2 feet revealed no soil discolorations. Since no visual evidence was detected, no samples were taken (Earth Technology Corporation, 1993).

Former Storage Area (AREE 21). An area to the east of Building 211 was used as a storage yard before the construction of Building 211. Reportedly, transformers and capacitors containing PCBs were stored in the area prior to disposal (Roy F. Weston, 1992).

The Enhanced PA recommended four soil borings to a depth of 4 feet and one soil sample from each boring should be analyzed for PCBs and TPH. The depth of the sample in each boring should be based on visual observation of the soil sample. (Roy F. Weston, 1992).

During the site inspection four composite soil samples were taken and analyzed for TPH, PCBs, and pesticides. Sampling results indicate that detectable concentrations of TPH exist in all four samples (Earth Technology Corporation, 1993).

Drainage Ditch (AREE 22). A drainage ditch that enters WRF along the northern boundary and flows along the north and east sides of the inner fenced compound may have received contamination from the wash rack, the oil/water separators, various oil spills, and run-on from off-site properties to the north. Aerial photographs revealed possible stains and wet soil in the vicinity of the ditch during the 1960s, and tires and other debris were observed during the site visit. (Roy F. Weston, 1992).

The Enhanced PA recommended that a stream sediment sample and a surface water sample be taken upstream where the ditch enters the facility and downstream where it enters the Occoquan Bay. The samples should be analyzed for TPH.

During the site inspection three surface water samples and four sediment samples were collected after a rainstorm from four different locations along the drainage ditch. Two sediment samples had detectable concentrations of TPH (approximately 14 and 18 ppm). TPH was not detected, however, in the three surface water samples (Earth Technology Corporation, 1993).

Former Underground Storage Tanks (AREE 23). At the WRF installation, six USTs have been removed, five of which were within the compound area. These USTs were believed to be leaking or they failed a leak test. The two USTs suspected of leakage were removed before the present UST regulations were in place, and no soil samples were collected. The other three USTs have been removed since 1990 after failing leak tests. Soil samples from beneath the USTs were taken following excavation. The analysis of the samples indicated that TPH was less than 25 ppm for each of the three tanks. The VWCB requires remedial action if the TPH is greater than 100 ppm (Roy F. Weston, 1992).

The following USTs have been removed from the installation:

- Building 202- 10,000 gal. steel tank, diesel fuel, no leak test.
- Building 202 -10,000 gal. steel tank, #2 fuel, failed leak test, soil < 25 ppm TPH.
- Building 202 -10,000 gal. steel tank, #2 fuel, failed leak test, soil < 25 ppm TPH.
- Building 202 - 1,000 gal. steel tank, gasoline, failed leak test, soil< 25 ppm TPH.
- Building 203 - 2,000 gal. steel tank, #2 fuel, no leak test, no sample results information.
- Building 101 - 1,000 gal. steel tank, #2 fuel oil, failed leak test.

Fall 1993 site inspection activities included ground water sampling, surface soil sampling, excavated soil sampling, excavation, visual inspection and land surveying. The UST areas were also surveyed with magnetic and ground penetrating radar to locate tanks. Soil samples from spill areas associated with former USTs near building

202 tested between 209 and 302 ppm TPH. Soil samples from spill areas associated with a former UST near building 203 tested approximately 30 ppm TPH (Earth Technology Corporation, 1993).

Existing Underground Storage Tanks (AREE 24). There are six existing USTs at WRF, four of which are within the compound area. Of these, two have been leak-tested and have passed the test. The remaining tanks will be leak-tested in the next two years. If this program is conducted and all UST regulations are complied with, then no additional sampling is recommended. The remaining tanks should be tested as soon as possible because several tanks have been tested and determined to be leaking (Roy F. Weston, 1992).

- Building 202 - 2,000-gal. fiberglass tank, diesel fuel, installed 1981.
- Building 202 - 1,000-gal. fiberglass tank, gasoline, installed 1990.
- Building 203 - 10,000-gal. steel tank, #2 fuel oil, installed 1966.
- Building 211 - 1,500-gal. steel tank, #2 fuel oil, installed 1976.
- Building 306 - two 300-gal. steel tanks - one #2 fuel oil, one diesel fuel - installed 1976.

4.1.2 2D-HR/HS: Ethylene Glycol Hose Burial Area (AREE 26) and Target Range

To test a personnel and intrusion detection system, rubber hoses containing antifreeze (ethylene glycol) were buried near Building 306. The hoses were placed in an irregular pattern over a 2,000-foot by 2,000-foot area at a depth of 1 to 3 feet. It is believed that most of the hoses were placed in the ground 20 years ago and are still intact. (Roy F. Weston, 1992).

The Enhanced PA indicated that this burial area was south of Charlie Road. After further interviewing and a site visit, the location of this burial area was determined to be north of the road and within a large 24-acre area. (I-5).

Periodically, these hoses are excavated and some antifreeze has leaked onto the ground. This area has been disqualified because ethylene glycol was listed in 1991 as a hazardous substance under CERCLA and ethylene glycol was both released and stored in reportable quantities (over 1 pound) for several years.

Pure antifreeze has a relatively high biological oxygen demand (BOD) and may contain toxic additives that could violate receiving water and ground water standards if it is allowed to flow untreated from the area. Moreover, small animals such as cats are attracted to the sweet taste of antifreeze and are often killed by ingesting this substance. Ideally, antifreeze should be collected in containers and taken to an antifreeze recycling facility. (RCRA Hotline, I-26).

The Enhanced PA recommended that the hoses be removed, if that can be done practically without loss of antifreeze to the soil. Soil borings should be taken to a depth of 4 feet and analyzed for ethylene glycol. The borings should be randomly placed at a density of one per acre. (Roy F. Weston, 1992).

During the site inspection activities in Fall 1993, nine trenches were excavated. No antifreeze hoses were encountered and no soil samples were taken. The site inspection contractor, Earth Technology, has recommended an expansion of the excavation area until four locations with hoses are uncovered (Earth Technology Corporation, 1993).

Directly south of the ethylene glycol hose burial area lies a former hunter qualification target range. This area, just south of Charlie Road, includes a firing point and backstop area. It was estimated by site personnel that approximately 1,000 rounds were fired at this site. Since each slug equates to approximately 1 ounce of lead, it was estimated that approximately 1,000 ounces of lead may still exist on this site. The site inspection contractor, Earth Technology, has recommended that this area undergo further soil sampling to determine the presence of lead contamination (I-29).

4.1.3 3D-PS Building 306 Area (AREE 24)

Two 300-gallon steel USTs were installed in the Building 306 area in 1976. One tank contains #2 fuel oil and the other tank contains diesel fuel. No leak tests have been conducted on these two tanks.

Building 306 is a small shed with a concrete foundation and wood walls. The building design plans indicate that the roof may contain asbestos materials within the roof flanging.

4.1.4 4D-PS/HR(P) The Front Gate Area (AREE 23)

The guard house area at the front gate formerly contained a UST. The 1,000-gallon steel tank was installed in 1966 and contained #2 fuel oil. The tank was removed in 1991 after failing a leak test. An analysis of soil samples indicated 230 ppm TPH for the soils surrounding the guardhouse tank. The VWCB requires remedial action if the TPH is greater than 100 ppm. A contractor excavated and removed the TPH contaminated soils from the site. (I-20).

4.1.5 5D-HR Landfill Area

Landfill No. 2: (AREE 2). Landfill No. 2 was used as a disposal area for PCB-containing transformers and capacitors in the early 1970s. The contaminated debris was excavated and removed in 1985. Six monitoring wells were installed around the site of the landfill, and samples were taken annually and analyzed for PCBs. In 1990, PCB concentrations of up to 7 ppb were found in the wells.

Although there is no record of materials disposed of at the landfill, because of its long use there is a potential that hazardous materials were disposed of at this site (I-20; Roy F. Weston, 1992).

The site inspection field work at AREE 2 during Fall 1993 included ground water sampling, soil sampling, a geophysics survey, a visual inspection, and land surveying. Due to extensive environmental investigations, including the former investigation of the landfill, no exploratory trenches were excavated during the site inspection.

Five of the six existing ground water monitoring wells were purged and sampled. Surface water and sediment samples were also taken from Marumsco Creek immediately south of AREE 2. Three of four sediment samples collected contained detectable concentrations of PCBs. No PCBs, VOCs, or pesticides were detected in the ground water or surface water samples (Earth Technology Corporation, 1993).

Landfill No. 3: (AREE 3). A landfill located east of the pond was used for disposal of wire, paper, plastic, and wood. It was used in the 1960s and 1970s and was covered with soil in 1973. Although there is no record of materials disposed of at this landfill, the presence of hazardous materials is highly possible due to the long-term use of the landfill (I-20, Roy F. Weston, 1992).

The site inspection field work at AREE 3 during Fall 1993 included ground water sampling, soil sampling, direct push sampling, a geophysics survey, a visual inspection, and land surveying.

Three trenches were excavated to a depth of six feet. Various types of debris were uncovered such as a tractor tire, sheet metal, and automobile parts. No PCBs, pesticides, and VOCs were detected in soil or ground water samples (Earth Technology Corporation, 1993).

Landfill No. 4 (AREE 4). A landfill is located just south of Deephole Point Road, east of Shady Road. It was used for disposal of wire, trash, and empty oil drums from the 1950s until its closure in 1973, when it was covered with soil.

Although there is no record of hazardous material disposal, the potential that hazardous material are in the landfill remains likely because of its long-term use. The Enhanced PA recommended a comprehensive sampling program of this site and the installation of three monitoring wells to ground water depth. Two should be downgradient of the landfill and one should be upgradient. At the time of the CERFA assessment, the installation was in the process of trenching all landfills to determine potential contents and sampling soils at the landfill site. (I-20; Roy F. Weston, 1992).

The site inspection field work at AREE 4 during Fall 1993 included ground water sampling, soil sampling, direct push sampling, a geophysics survey, a visual inspection, and land surveying. Five trenches were excavated to a depth of six feet.

Various types of debris were uncovered such as wood, metal, cable, plastic, and barbed wire. One excavated soil sample indicated detectable concentrations of PCBs and TPH (Earth Technology Corporation, 1993).

Landfill No. 5 (AREE 5). Another landfill is located near Landfill No. 2. It operated during the 1950s and 1960s and was closed before 1970. Although waste types were not recorded the presence of hazardous materials remains likely due to the long-term use of this landfill. At the time of the CERFA assessment, the installation was in the process of trenching all landfills to determine potential contents and sampling soils at the landfill sites. (I-20; Roy F. Weston, 1992).

The site inspection field work at AREE 5 during Fall 1993 included ground water sampling, soil sampling, direct push sampling, a geophysics survey, a visual inspection, and land surveying. Three trenches were excavated to a depth of six feet. Various types of debris were uncovered such as car parts, timber, an angle iron, metal, cable, sheet metal, and a 55-gallon drum. One upgradient ground water sample contained detectable concentrations of PCBs. In addition, three soil samples contained detectable concentrations of TPH and one soil sample contained detectable concentrations of PCBs. Some of the soil samples also contained detectable concentrations of pesticides (Earth Technology Corporation, 1993).

Potential Landfill 6A (AREE 6-A). Two potential landfills (AREE 6A and AREE 6B) were identified from aerial photographs. Metal debris was observed on the ground during the Enhanced PA site visit.

The site inspection field work at AREE 6A during Fall 1993 included ground water sampling, soil sampling, direct push sampling, a geophysics survey, a visual inspection, and land surveying. Four trenches were excavated to a depth of six feet. Two of the trenches uncovered various types of debris such as metal cable, barbed wire, timber, and a 55-gallon drum. The two soil samples and one ground water sample contained no detectable concentrations of pesticides or PCBs. Ground water samples were not tested for VOCs at this location due to turbidity (Earth Technology Corporation, 1993).

4.1.6 6D-HR Landfill Area and Pistol Range

Landfill No. 1: (AREE 1). Landfill No. 1 is located next to Occoquan Bay. It was closed in 1973 after operating for an undetermined period. The landfill was used as a dumping site for construction debris including concrete, scrap metal, asphalt, wire, and pipe. Potential ACM were observed during the site visit. The landfill area was used as a firing range during the 1950s and 1960s.

Six monitoring wells were installed around the landfill in 1985 to monitor PCBs in ground water. Samples have been taken from these wells annually and analyzed for

PCBs. No detectable amounts of PCBs have been found in the samples (I-20; Roy F. Weston, 1992).

Although there is no record of waste types at the landfill, the presence of hazardous materials remains likely due to the long-term use of the landfill.

The site inspection field work at AREE 1 during Fall 1993 included ground water sampling, soil sampling, a geophysics survey, a visual inspection, and land surveying. Four trenches were excavated to a depth of six feet. Various types of debris were uncovered such as scrap metal, cable, plastic, and concrete.

A total of two soil samples and one replicate sample were taken. All three soil samples indicated detectable concentrations of PCBs. Six existing ground water monitoring wells were purged and sampled. All ground water samples were analyzed for VOCs, pesticides, and PCBs. None of the six samples contained detectable concentrations (Earth Technology Corporation, 1993).

In March 1993 the Virginia DEQ collected a surface water sample south of AREE 1 and along the coastal perimeter of the site. The PCB concentration from this sample was 15 ppb. In May 1993, Virginia DEQ collected eight soil samples from AREE 1. The reported maximum PCB concentration was 1,100 ppb. Fourteen tissue samples were also collected and the maximum PCB concentration was 1,500 ppb. These sampling events will contribute to a study, which is not yet released, by the VWCB, *Coastal Zone Management - Bioaccumulation Initiative* (See Section 3.2).

Potential Landfill 6A. AREE 6B was identified from aerial photographs. Metal debris was also observed on the ground during the Enhanced PA site visit. (I-20; Roy F. Weston, 1992)

The site inspection field work at AREE 6B during Fall 1993 included ground water sampling, soil sampling, direct push sampling, a geophysics survey, a visual inspection, and land surveying. Three trenches were excavated to a depth of six feet. Since no debris was encountered, no soil samples were taken. Two ground water samples were taken at depths of 13 and 18 feet. No detectable concentrations of PCBs, pesticides, or VOCs were present (Earth Technology Corporation, 1993).

Pistol Range (AREE 7). Facility personnel used an embankment north of Landfill No. 1 as a pistol range during the 1970s. It reportedly was used only twice a year for qualification of facility personnel.

The embankment was covered over with dirt during the early 1980s. No visible lead shot was observed during the CERFA assessment.

During the site inspection five cubic feet of soil was excavated with a backhoe and examined visually and with a metal detector. No bullets were found (Earth Technology Corporation, 1993).

Soil samples of AREE 7 will be compared against background samples from the area to determine if unusually high concentrations of metals are present. A preliminary comparison, however, shows that metal concentrations within AREE 7 are similar to background concentrations (I-29).

4.1.7 9D-HR(P), 10D-HR(P), 11D-HR(P) - Sewage Injection Areas (AREE 25)

In 1974, sanitary sewage sludge from nearby municipal treatment plants was injected into the ground throughout the northern part of the facility. Reportedly, approximately 20,000 gallons per day was injected to a depth of 18 inches over a 4-month period. It is believed that the sewage was domestic waste and not industrial. Sludge injection is a common practice and generally does not cause contamination unless the sewage contains metals from industrial sources. However, because there is a potential for industrial sludge to have been disposed of at WRF, the Enhanced PA recommends that six soil borings be taken from the injection areas and analyzed for TAL metals. (Roy F. Weston, 1992).

The Enhanced PA did not specify the locations of the three different areas used for sewage injection in 1974. The report only described this area as "throughout the northern part of the facility." Based upon further interviews, it appears that sewage sludge injection took place in the northern, western, and eastern parts of the installation. For this reason, the site should increase the number of samples to adjust for larger areas detailed by the CERFA assessment map.

During the site inspection, six surface soil samples were collected from the three former injection areas. All soil samples were analyzed for metals. The metals concentrations from these six samples are provided in the site inspection report (Earth Technology Corporation, 1993).

These metals concentrations will be compared to background concentrations in the area to determine if unusually high concentrations of metals are present. A preliminary comparison, however, shows that metal concentrations within AREE 25 are similar to background (I-29).

4.2 Additional Areas Requiring Environmental Evaluation Identified by CERFA Investigation

The scope of work of the CERFA assessment requires the identification of areas that would not necessarily be included in the ongoing site or remedial investigations. While the ongoing investigations address areas of suspected contamination and define the areas requiring remediation, the CERFA investigation requires identification of

current and past areas of storage, release, and disposal of hazardous substances or petroleum products or their derivatives even if there is no residual contamination. The difference in the objectives has resulted in a number of areas that are not current remediation areas (e.g., areas of current or past petroleum storage, past storage of hazardous substances, or potential release or disposal of hazardous substances) being classified as CERFA disqualified. (See Table 5-1 for details on these areas within each parcel.) In addition, several areas were disqualified based on incomplete information and without direct evidence of storage, release, or disposal activities. These areas are identified in the table with a (P) for probable/potential in the parcel code.

4.2.1 9D-HR(P), 10D-HR(P), 11D-HR(P) Sewage Injection Areas

The Enhanced PA did not specify the locations of three different areas used for sewage injection in 1974 during a 4-month interval. Three main sewage injection areas are classified as disqualified CERFA parcels (see Figures 5-1, 5-2, and 5-3). These parcels are listed as 9Q-HR(P), 10Q-HR(P), 11Q-HR(P) and are designated as disqualified. Sewage injection on these three parcels could have introduced hazardous releases. As the Enhanced PA suggests, the introduction of industrial sludges could have contaminated the soils with heavy metals. The potential, however, for actual contamination remains low since this region is mostly residential and agricultural.

4.2.2 7D-PR Bulldozer Diesel Spills

Two bulldozer diesel fuel releases occurred in 1991. A contractor reportedly drained 80 gallons of diesel fuel directly onto an open grassy area between the landfill area and the compound parking lot. Within one week, the contractor released another 80 gallons in the same general area. The installation removed all contaminated soil and placed the soils onto a tarp located within the general spill area. ARL-Risk Management arranged for the proper disposal of contaminated soils. It is recommended that soil samples be taken and analyzed for TPH. The Enhanced PA identified only one of these spills and described the spill as hydraulic oil. After further investigation, during the CERFA assessment, it was determined that two spills occurred and both were diesel fuel releases.

4.2.3 VEPCO Transformer Area (front gate area)

The Enhanced PA report did not detail an incident that occurred at the northwest corner of the site in 1984. Three of VEPCO's transformers blew up in 1984, which caused the site to lose power. Apparently, a power surge overloaded the transformers, which caused the explosion. VEPCO replaced and removed the old transformers. VEPCO also removed soils around the transformer site and replaced the soils with gravel. According to an operations supervisor for VEPCO's Woodbridge region, no case history or occurrence report is available (I-17). According to installation personnel (I-12, I-13), the transformers were thought to contain PCBs.

4.2.4 8D-PR Hydraulic Fluid Spill From Crane

In May 1993, a hydraulic oil spill from an old crane occurred on Beach Road. The spill was approximately 50 gallons. The contaminated soil was excavated and piled alongside the road and covered with a tarp. At the time of the CERFA assessment, the site was arranging with a contractor for disposal of the soil.

4.2.5 Ethylene Glycol Filled Hose Area

According to two installation interviews (I-12, I-13), ethylene glycol (antifreeze) filled neoprene hoses were buried to the north of Charlie Road in the northeast area of the site. The Enhanced PA indicated that this burial area was located to the south of Charlie Road. After further interviewing and a site visit, the location of this burial area was determined to lie north of the road and within a rather large 24-acre area.

Periodically, these hoses were excavated and some antifreeze leaked out. This area has been disqualified because ethylene glycol was listed in 1991 as a CERCLA hazardous substance and was released to the ground over the past several years during various excavation projects. (See Section 4.4).

4.3 Adjacent or Surrounding Properties

The records search of federal and state databases (see Section 2.2) revealed that:

- No NPL sites are within a 1-mile radius.

- A former fiberglass manufacturing site located approximately 1 mile southwest of WRF is currently under CERCLA review. This site is not expected to influence the WRF facility since the ground water and surface waters appear to flow directly into the Occoquan Bay.

- Four hazardous spill reports (occurring between February 1987 and March 7, 1990) were located within a 1-mile radius of the site (they are listed in Section 2.2). Although three of these spills eventually emptied into the Occoquan Bay area, and may affect Marumsco Creek area, significant influence to the WRF installation remains low.

  The closest spill occurred at 13800 Dawson Beach Road on May 11, 1989. The responsible party was listed as Arban and Carosi, which is located less than 400 feet from the Dawson Beach Road entrance to WRF. Arban and Carosi, a precast cement manufacturer, spilled wash water. The amount spilled was not specified in the report. Interviews with a safety manager and the owner of Arban and Carosi indicated that no hazardous substances are contained in the wash water (I-21, I-24). The adjacent installation property, near the front gate of WRF, has been disqualified primarily due to an underground storage tank and transformer explosion and not necessarily due to reported wash water spills.

- Several different types of businesses exist along Route 1. Most of the RCRA notifier facilities are dry cleaning establishments, auto or body shops, or service stations. Most of the 42 listed facilities are small quantity generators. Six large quantity generators were located with a mile radius. The two closest to WRF are a Toyota dealership and a Sunoco service station on Route 1. These locations are not directly adjacent to the installation and will therefore not disqualify installation parcels near the perimeter of the WRF property.

- The majority of leaking USTs and spills were associated with gas stations located along the main highway (Route 1), located half s mile northwest of the site. These service stations are also not directly adjacent to installation property and will not significantly affect or disqualify WRF property. Moreover, installation personnel (I-12, I-13) have not noticed petroleum slicks or odors along the coastal perimeter of the WRF property.

4.4 Related Environmental, Hazard, and Safety Issues

Military installations frequently contain issues that USAEC believes fall outside of the provisions of CERCLA. For example, while a release of lead-based paint onto the ground may be a CERCLA concern, the application of lead-based paint to a building surface is generally not. However, lead-based paint applied to buildings may represent a safety hazard to young children. Similarly, other substances or materials commonly applied to or found in buildings (for example, radon and asbestos) may not be explicitly regulated under CERCLA, but may require a notice to potential transferees and lessees that they exist.

USAEC has sought to balance the statutory requirements of CERFA with the law's intent to identify uncontaminated property to the public that can be expeditiously reused. Notice has been provided for those parcels that appear to be uncontaminated under the definition provided in CERFA, but which may contain environmental, hazard, or safety issues. Buildings that contain ACM, lead-based paint, or naturally occurring radon fall into this category and are identified as CERFA parcels with qualifiers in this CERFA report. Parcels that contain stored (not in use) equipment that contain some level of PCB oil, stored low level radionuclide-containing equipment such as dials and weapon site posts, and UXO are also designated CERFA parcels with qualifiers.

In those cases, however, where for example, asbestos or PCBs have been disposed of in the environment, the parcel has been identified as CERFA disqualified. In this example, the designation indicates that a CERCLA hazard may exist at this location.

4.4.1 Asbestos and Lead

No comprehensive asbestos survey or lead paint survey has been conducted at WRF. All existing buildings on site were constructed between the early 1950's and 1979.

Considering this time period, it is possible that both lead paint and asbestos are contained within the buildings. Although some asbestos removal within the main compound area has occurred, no comprehensive survey of asbestos has been conducted to ensure all necessary removal from all existing buildings. Moreover, the Enhanced PA has noted additional areas where suspected ACM may exist -- including floor tiles and associated mastic, mastic on ceiling tiles, and ACM debris that is possibly buried in ravines and landfills of the facility. According to a site interview (I-20), buildings on site have not been tested for lead paint.

4.4.2 PCBs

All eight existing transformers on site have been tested for PCBs in July and August 1990. Seven of the eight had less than 10 ppm PCB. The other transformer contained 565,800 ppm PCB. According to the Enhanced PA, it was determined to be Aroclor 1260 in Pyranol oil. The PCB transformer was located outside at the northeast corner of Building 201, on a fenced concrete pad. It was the only transformer at that location, but attached to it is an electrical switch containing 65 gallons of pyranol. According to the Enhanced PA the switch was labelled as containing PCB. The transformer was removed in December 1992 and the concrete pad, which displayed no evidence of leaks, was removed as well.

Other PCB issues involving landfilling of PCB-laden transformers and capacitors are CERFA-related issues since a release occurred and remediation activities were performed -- including removal of transformers and ground water monitoring.

4.4.3 Radiological Issues

A document review of radioactive materials used at CERFA installations was conducted in March 1994 by the Health Physics Division. Specifically a review of active NRC licenses, Department of Army Radioactive Material Authorizations (DARA) files, and the U.S. Army Environmental Hygiene Agency (USAEHA) archival report files were researched to determine the use of radioactive materials at the 32 CERFA installations, including WRF.

According to the records search of the Health Physics Division active license files, no records were found to indicate that WRF had an NRC license or DARA.

Six of the seven reports from the records search addressed ionizing radiation. This type of radiation is commonly used directly in Army systems such as calibration and check sources for survey type instruments and as a source for radioluminescence. One or two items, when properly used, are considered a negligible hazard. Potential hazards could potentially arise if many ionizing radiation sources were collected together at a repair facility or warehouse. Historical documentation and the known history of the site did not reveal, however, any hazards from the stockpiling of ionizing radiation sources.

One record (Report of Special Radiological Hygiene Study No. 3213R50-58/61, September 16, 1960) from the records search revealed that a study had been conducted to determine the effects of the 300 KW transmitter due to potential hazards of microwave energy and ionizing radiation. The purpose of the study was "to evaluate the radiation exposure to persons operating, and to those remaining in the vicinity of the 300 Kilowatt Radio Transmitter." No known residual radiation contamination is known, however, to occur from microwave energy.

4.5 Sites With Historical or Ongoing Remediation Efforts

Five landfill sites have undergone historic remediation efforts at WRF. The entire area of investigation for each of these sites (AREEs 1-6) has been categorized as CERFA disqualified since the potential for contamination was identified at one time.

4.5.1 Landfill Areas

Five known landfills and two potential landfills exist near the Marumsco Creek area on the southwest border of the WRF property (see Sections 4.1.5 and 4.1.6). The landfill parcels are disqualified because PCB containing transformers were buried in these landfills in the early 1970s. The contaminated debris was excavated in 1985.

A total of twelve monitoring wells were installed around Landfill No. 1 and Landfill No. 2. These ground water monitoring wells were monitored between 1985 and 1990 for PCBs. Trace concentrations of up to 7 ppb were noted. This concentration is below the acute toxicity level of 350 ppb.

The site is currently in the process of trenching the landfills and taking soil samples. The Enhanced PA report recommended additional ground water monitoring wells and continued monitoring of both ground water and nearby surface water.

4.6 CERFA Excluded Parcels

The CERFA assessment reviewed the entire 579 acres which comprises the WRF. No tracts or WRF property was excluded from CERFA assessment and designation.

4.7 CERFA Parcels

The remaining property that is not disqualified lies with Parcel 12P or 13P. Although maps, documents, site investigation, and interviews revealed no evidence of hazardous releases and storage or petroleum releases and storage, the CERFA assessment has highlighted a few general concerns, discussed below.

CONUS Communications Network. Before 1970, the site was used as a U.S. Army Strategic Communications Command Facility. As such, the site was almost entirely covered with a complex array of antennae and communications equipment. There has been speculation that when lightning would strike these antennae, certain electronic equipment (such as spark arrestors) would explode. If the equipment contained PCBs, a potential release would be possible. (I-1, I-10, I-11).

Since these antennae may have used spark arrestors at each antennae site, the CERFA assessment included an informal survey of spark arrestor manufacturers to determine whether the spark arrestors were filled with liquids or oils and if it would be possible for these liquids to contain PCBs. A survey of three different equipment manufacturers confirmed that these spark arrestors could explode due to a power surge such as lightning. During all interviews, however, equipment representatives and engineers mentioned that spark arrestors are filled with noble gases. Moreover, they were unaware of any brands of spark arrestors that used liquids. Perhaps other types of electronic equipment associated with the extensive antennae network, such as capacitors, may have contained PCBs. This however, remains speculative. Information regarding the construction of the communications network was considered classified during the operation of the CONUS communications network.

The CERFA assessment has uncovered maps, however, which reveal the location of antennae, although no information was uncovered that would indicate the details of antennae and associated equipment construction details. (U.S. Army Transmitting Station, 1961 Map, "Composite of Topography").

Buried Wire (AREE 27). Electrical cable was buried in the ground throughout the facility for various purposes since the 1940s. Most of the cable is believed to be still in the ground. Much of the cable has been abandoned in place and contains copper, aluminum, stainless steel, and sometimes lead shielding. Since the cable is not considered a waste, and remains relatively inert underground, underground cables do not provide reasonable cause for CERFA disqualification.

The Enhanced PA recommended that the cable be removed from the ground for inspection and chemical analysis. If the cable shows evidence of deterioration, soil samples should be taken and analyzed for TAL metals and PCBs, and the cable should be tested for PCBs.

5.0 Site Parcelization

After concluding the review of investigation documents, regulatory records, personnel interviews, and visual inspections, Arthur D. Little identified parcels on the installation as CERFA parcels, CERFA parcels with qualifiers, CERFA disqualified parcels, or CERFA excluded parcels in accordance with the definitions in Section 1.2. The parcels are delineated on a map of the BRAC portion of the installation using a 1-acre square grid for boundary definition.

The Army chose a 1-acre grid system to aid in the presentation of data gathered during the CERFA report investigation, and to facilitate use of the document by reuse groups and others. The 1-acre grid provided a consistent method to report and locate environmental or other concerns. In the many cases where the concerns are much smaller than 1 acre, the grid system simplifies the depiction of the concern. Accordingly, the areal extent of many small areas of concern, such as UST sites, are liberally depicted in the CERFA report.

Additionally, the 1-acre grid size was chosen as a generally redevelopable parcel size for either industrial or residential uses. However, the grid does not drive reuse nor restrict it. Reuse decisions should be made irrespective of the grid.

The entire 1-acre grid square is shaded to indicate the applicable parcel category based on the history of storage or release for any portion of that square. Parcels are labelled according to a system outlined in Section 1.2 of this report to indicate the applicable parcel category and the contaminating circumstances. Parcel labels are connected to the respective parcel boundaries by a line or are located within the parcel boundaries.

Where CERFA disqualified parcels and CERFA parcels with qualifiers have coincided, the overlapped area has been designated CERFA disqualified. Labels for any such overlapped parcels also indicate the presence of the qualifying hazards. CERFA excluded parcels have been excluded from this investigation of contaminant locations and therefore have no overlapping CERFA disqualified parcels or CERFA parcels with qualifiers. Structures within CERFA disqualified parcels that contain qualifying safety hazards are designated with the applicable qualifying label, where map scale permits this level of detail.

Arthur D. Little's investigation and subsequent parcelization of the WRF determined that approximately 373 acres of the facility fall within the CERFA parcel category. Approximately 206 acres constitute the CERFA disqualified portion of the installation. The larger CERFA parcel (12P) comprises 371 acres and stretches across the entire WRF property. The smaller CERFA parcel comprises only 2 acres and is located in the southwest corner of the property.

In determining the applicable parcel categories for the installation property, Arthur D. Little observed the following guidance provided by the USAEC for specific circumstances:

- Buildings constructed prior to 1978 are assumed to contain lead-based paint. A similar assumption is made for asbestos in buildings constructed prior to 1985.

- Storage of petroleum products, petroleum derivatives and CERCLA-regulated hazardous substances will prevent an area from becoming a CERFA parcel as long as that storage is for one year or greater. The quantity of substances stored is not relevant to determining the applicable parcel category. However, if the operation requiring such substances is in the immediate area, and the storage is in limited quantities for immediate use, the area is not precluded from being a CERFA parcel.

- Non-leaking equipment containing less than 50 ppm PCBs does not preclude an area from becoming a CERFA parcel. Non-leaking, out-of-service equipment with greater than 50 ppm PCBs will place an area in the CERFA parcel with qualifier category. An area is designated CERFA disqualified if there is a known release containing greater than 50 ppm PCBs.

- Areas where there are transport systems or process equipment which handle hazardous material or petroleum products and upon which there have been no release, storage, or disposal are categorized as CERFA parcels.

- Ordnance disposal locations are designated CERFA disqualified. This does not include ordnance impact areas, which are designated CERFA parcels with qualifiers.

- Routine pesticide and herbicide application in accordance with manufacturer's directions and chlorofluorocarbons and halon in operational systems do not preclude an area from becoming a CERFA parcel.

- Coal storage piles and railroad tracks do not by themselves preclude an area from becoming a CERFA parcel.

5.1 Designation of Parcels for CERFA Assessment

Table 5-1 and Figure 5-1 identify the breakdown of the WRF property according to the criteria for parcel identification under CERFA.

5.2 Tract Map and Property Boundaries

The property boundaries and all property transfers, including prior ownership information, is shown in Figure 5-2.

5.3 Summary CERFA Map

Figure 5-3 summarizes the breakdown of the WRF property according to the criteria for parcel identification under CERFA.

Table 5-1: Parcel Identification Table, Woodbridge Research Facility, Woodbridge, VA

Parcel Number	Location, Size, and AREE No.	Map Coordinates	Category	Parcel	Source of Evidence	Additional Studies/ Remediation Efforts
1D-HR/HS/PR/PS Central Compound, parking lot, drainage ditch, and drainage basin southeast of compound	90 acres, Central compound, drainage ditch, and parking lot.	21, 18	Disqualified	The entire compound area, parking lot, and drainage ditch have been designated as CERFA disqualified due to the incidents listed below involving hazardous releases, hazardous storage, petroleum releases, and petroleum storage.	Enhanced PA (I-1, I-3, I-5, I-6, I-10, I-12, I-13, I-20) Maps	See below.
	AREE 8 (Building 202)		Disqualified	The following sites were identified in the Enhanced PA: UST Leaks and Spills. Area contained three 10,000-gallon USTs that were removed after leaking. Several major spills during UST filling and oil transfers. Water and oil seeps into pit in nearby maintenance shop area after rain. Six USTs removed in the compound area. Four as a result of failed leak tests in 1990 and 1991 and two that were removed earlier after determining leaks. Two of removed USTs were replaced with existing USTs.	Enhanced PA (I-1, I-3, I-5, I-6, I-10, I-12, I-13, I-20) Maps	Contaminated soil was removed.
	AREE 10 (Building 202)		Disqualified	Hazardous waste storage in maintenance shop, including: motor oil solvents, brake fluid, battery acid, paint, and thinner.	Enhanced PA (I-1, I-3, I-5, I-6, I-10, I-12, I-13, I-20) Maps	Under investigation.
	AREE 11 (N of Building 202)		Disqualified	Waste oils from motor pool emptied into drains that ran to oil/water separator. Water discharged to grounds. Vehicle wash rack also discharged to oil/water separator.	Enhanced PA (I-1, I-3, I-5, I-6, I-10, I-12, I-13, I-20) Maps	Oil/water separator was cleaned out in June 1993.
	AREE 12 (N of Building 211)		Disqualified	Drum Storage Area - waste drums were stored on pavement north of maintenance shop and contained waste oil, paints, cleaning solvents, antifreeze, and brake fluid. Drums were periodically sent to ARL, Adelphi, MD.	Enhanced PA (I-1, I-3, I-5, I-6, I-10, I-12, I-13, I-20) Maps	Removal of drums.
	AREE 13 (Building 211)		Disqualified	Acid Neutralization tank and battery storage room.	Enhanced PA (I-1, I-3, I-5, I-6, I-10, I-12, I-13, I-20) Maps	Batteries have been removed. The acid neutralization tank was never used.
	AREE 14 (Building 211)		Disqualified	Oil/Water Separator - UST connected to drain in work area in Building 211. Water drains to field east of building.	Enhanced PA (I-1, I-3, I-5, I-6, I-10, I-12, I-13, I-20) Maps	Under investigation.
	AREE 15 (Building 201)		Disqualified	Transformer located near Building 201 was found to contain 56% PCBs. This transformer was located on a fenced concrete pad and finally removed in December 1992.	Enhanced PA (I-1, I-3, I-5, I-6, I-10, I-12, I-13, I-20) Maps	PCB-containing transformers removed in December 1992. No testing or remediation of concrete pad.

Table 5-1: Parcel Identification Table, Woodbridge Research Facility, Woodbridge, VA (continued)

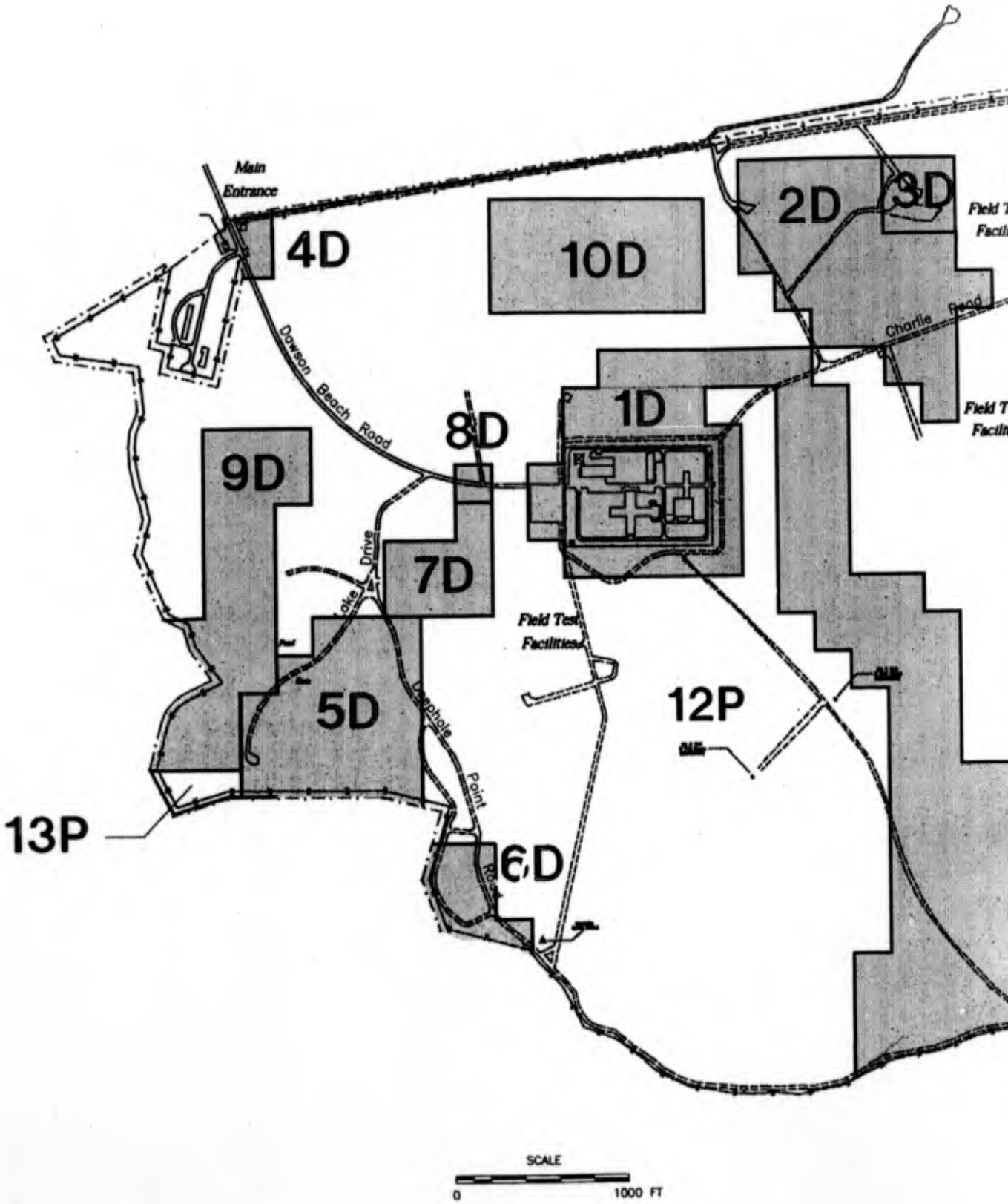
Parcel Number	Location, Size, and AREE no.	Map Coordinates	Category	Parcel	Source of Evidence	Additional Studies/ Remediation Efforts
1D-HR/HS/PR/PS (continued)	AREE 16 (Buildings 201, 202, 203, and transit pipes underground on compound)		Disqualified	Most asbestos has been removed on site, although a comprehensive asbestos survey has not been conducted. The older buildings (201, 202, and 203) constructed in 1950 are more likely to contain asbestos that Building 211. Also, a general signal communication map reveals the presence of transit (an asbestos-containing cement) underneath the compound and parking lot area.	Enhanced PA (I-1, I-3, I-5, I-6, I-10, I-12, I-13, I-20) Maps	Most asbestos removed on site, although there are still areas that contain asbestos and no complete asbestos assessment has occurred.
	AREE 17		Disqualified	Spill Areas from hydraulic oil crane leaks.	Enhanced PA (I-1, I-3, I-5, I-6, I-10, I-12, I-13, I-20) Maps	Oil/water separator cleaned out and contaminated soil removed.
	AREE 18 (Building 204)		Disqualified	Flammable/Battery Storage - storage building for drums and batteries.	Enhanced PA (I-1, I-3, I-5, I-6, I-10, I-12, I-13, I-20) Maps	Flammable materials and batteries removed.
	AREE 19		Disqualified	Thermal Battery Storage.	Enhanced PA (I-1, I-3, I-5, I-6, I-10, I-12, I-13, I-20) Maps	Metal "transportainers" removed in Spring 1993.
	AREE 20 (SE corner of cpd)		Disqualified	Former Incinerator (removed in 1972) with asbestos lining and 100-gallon fuel AST	Enhanced PA (I-1, I-3, I-5, I-6, I-10, I-12, I-13, I-20) Maps	Incinerator removed and materials - including asbestos - were disposed in onsite landfill in 1972.
	AREE 21 (E of Building 211)		Disqualified	Former Storage Area - During the early 1970s, this area was used as a storage yard before Building 211 was built in 1979. Transformers and capacitors were stored in this area prior to disposal.	Enhanced PA (I-1, I-3, I-5, I-6, I-10, I-12, I-13, I-20) Maps	Under investigation.
	AREE 22 Drainage Ditch North of Compound		Disqualified	Drainage Ditch - Oil spills have drained into ditch.	Enhanced PA (I-1, I-3, I-5, I-6, I-10, I-12, I-13, I-20) Maps	Under investigation.
	AREE 23 (Building 101) (Building 202) (Building 202) (Building 202) (Building 202) (Building 203)		Disqualified	Former Underground Storage Tanks - Six removed. Steel, 1,000 gallon No. 2 fuel oil, failed leak test, soil >25 ppm TPH Steel, 10,000 gallon Diesel, no leak test Steel, 10,000 gallon No. 2 fuel oil, failed leak test, soil >25 ppm TPH Steel, 10,000 gallon No. 2 fuel oil, failed leak test, soil >25 ppm TPH Steel, 1,000 gallon gasoline, failed leak test, soil >25 ppm TPH Steel, 2,000 gallon No. 2 fuel oil, failed leak test, soil >25 ppm TPH	(I-5) Maps Enhanced PA (p.5.13, 3.12)	Removed 1991. Removed 1981. Removed 1990. Removed 1990. Removed 1990. Removed 1986 or 1987.

Table 5-1: Parcel Identification Table, Woodbridge Research Facility, Woodbridge, VA (continued)

Parcel Number	Location, Size, and AREE No.	Map Coordinates	Category	Parcel	Source of Evidence	Additional Studies/ Remediation Efforts
1D-HR/HS/PR/PS (continued)	AREE 24 (Building 202) (Building 202) (Building 203) (Building 211)		Disqualified	Existing Underground Storage Tanks - Four located in compound. Fiberglass 2,000 gallon diesel, installed 1981, no leak tests Fiberglass 1,000 gallon gasoline, installed 1990, passed leak test Steel, 10,000 gallon No. 2 fuel oil, installed 1966, passed leak test Steel, 1,500 gallon No. 2 fuel oil, installed 1976, no leak tests	Maps Enhanced PA (p.3.13, 5.14)	No evidence of tank/piping leakage.
2D-HR	27 acres, AREE 26	26, 24	Disqualified	Antifreeze (ethylene glycol) filled hoses are buried 1-3 feet deep. Ethylene Glycol is a hazardous substance and was listed under CERCLA in 1991. Occasionally, when hoses are excavated, the antifreeze leaks on the ground.	(I-5) Enhanced PA (p.3.10, 3.11)	Currently under investigation.
3D-PS	4 acres AREE 24 Building 306	28, 26	Disqualified	Two existing underground storage tanks: Steel, 300 gallon No. 2 fuel oil, installed 1976 Steel, 300 gallon diesel fuel tank, installed 1976	(I-3, I-5) Maps Enhanced PA (p.5.14)	No evidence of tank/piping leakage.
4D-PS/HR(P)	Approx. 2.5 acres AREE 23	10, 25	Disqualified	Former Underground Storage Tank (AREE 23) Also, three VEPCO transformers blew up in 1984. VEPCO removed transformers within a few days.	(I-3, I-5, I-17) Maps Enhanced PA (p.5.13)	VEPCO removed contaminated soil and replaced with gravel.
5D-HR	Approx. 21 acres AREE 2 AREE 3 AREE 4 AREE 5 AREE 6	13, 12	Disqualified	Landfill Areas: Landfill #2 - contained capacitors and transformers with PCBs. Landfill #3 - no records, although hazardous materials used on site were disposed here. Landfill #4 - no records, although hazardous materials used on site were disposed here. Landfill #5 - no records, although hazardous materials used on site were disposed here. Potential Landfill #6a - landfill with possible hazardous substances.	 (I-5) Enhanced PA (p.5.8) Enhanced PA (p.5.8) Enhanced PA (p.3.5) Enhanced PA (p.5.9) Enhanced PA (p.3.6)	Excavated in 1984, contaminated material taken to HM Landfill. Six monitoring wells installed.
6D-HR	Approx. 4.5 acres AREE 1 AREE 6	16, 7	Disqualified	Landfill Areas and Pistol Range: Landfill #1 - closed in 1973, used to dump asbestos and potentially other hazardous materials. Potential Landfill #6b - landfill with possible hazardous substances. Pistol Range - rounds fired into soil bank. Covered with soil in 1982.	Enhanced PA (p.5.1) Enhanced PA (p.5.9)	Six monitoring wells installed. No remediation. None required.
7D-PR	7 acres AREE 17	15, 16	Disqualified	Two spills of bulldozer diesel fuel, each spill approximately 70 to 80 gallons.	(I-5) Enhanced PA (p.5.15)	Stained soil was quickly excavated, and taken off site for incineration.

Table 5-1: Parcel Identification Table, Woodbridge Research Facility, Woodbridge, VA (continued)

Parcel Number	Location, Size, and AREE No.	Map Coordinates	Category	Parcel	Source of Evidence	Additional Studies/ Remediation Efforts
8D-PR	1 acre	16, 18	Disqualified	Old crane leaked hydraulic oil in May 1993.	II-5, I-20)	Contaminated soil has been excavated and is currently waiting for off site disposal.
9D-HR(P)	AREE 25 19 acres	10, 18	Disqualified	(Note: The preliminary Assessment did not accurately locate the sewage injection areas.) Three sewage injection areas - during a 4-month period in 1974, 20,000 gallons per day of sewage were injected 18 inches into soil. This sewage sludge was not tested for heavy metals or other hazardous substances. The untreated sewage sludge was probably not hazardous since the region has remained non-industrial.	(I-5) Enhanced PA (p.5.11)	Currently under investigation; soil samples will be taken and analyzed.
10D-HR(P)	18 acres	19, 24	Disqualified			
11D-HR(P)	12 acres	33, 21	Disqualified			
12P	371 acres	22, 11	CERFA Parcel	No evidence of hazardous waste releases/storage or petroleum releases/storage. The parcel, however, contains an abundant amount of underground wires and cables. Also the materials used in association with the communications network equipment scattered throughout the site remains unknown.	(I-5) Enhanced PA	None required.
13P	2 acres	10, 1[illegible]	CERFA Parcel	No evidence of hazardous waste releases/storage or petroleum releases/storage.	(I-5) Enhanced PA	None required.


Main Entrance
4D
10D
2D
3D
Charlie Road
Dawson Beach Road
1D
8D
9D
7D
Drive
Field Test Facilities
5D
Deephole Point
12P
13P
6D
SCALE
0
1000 FT

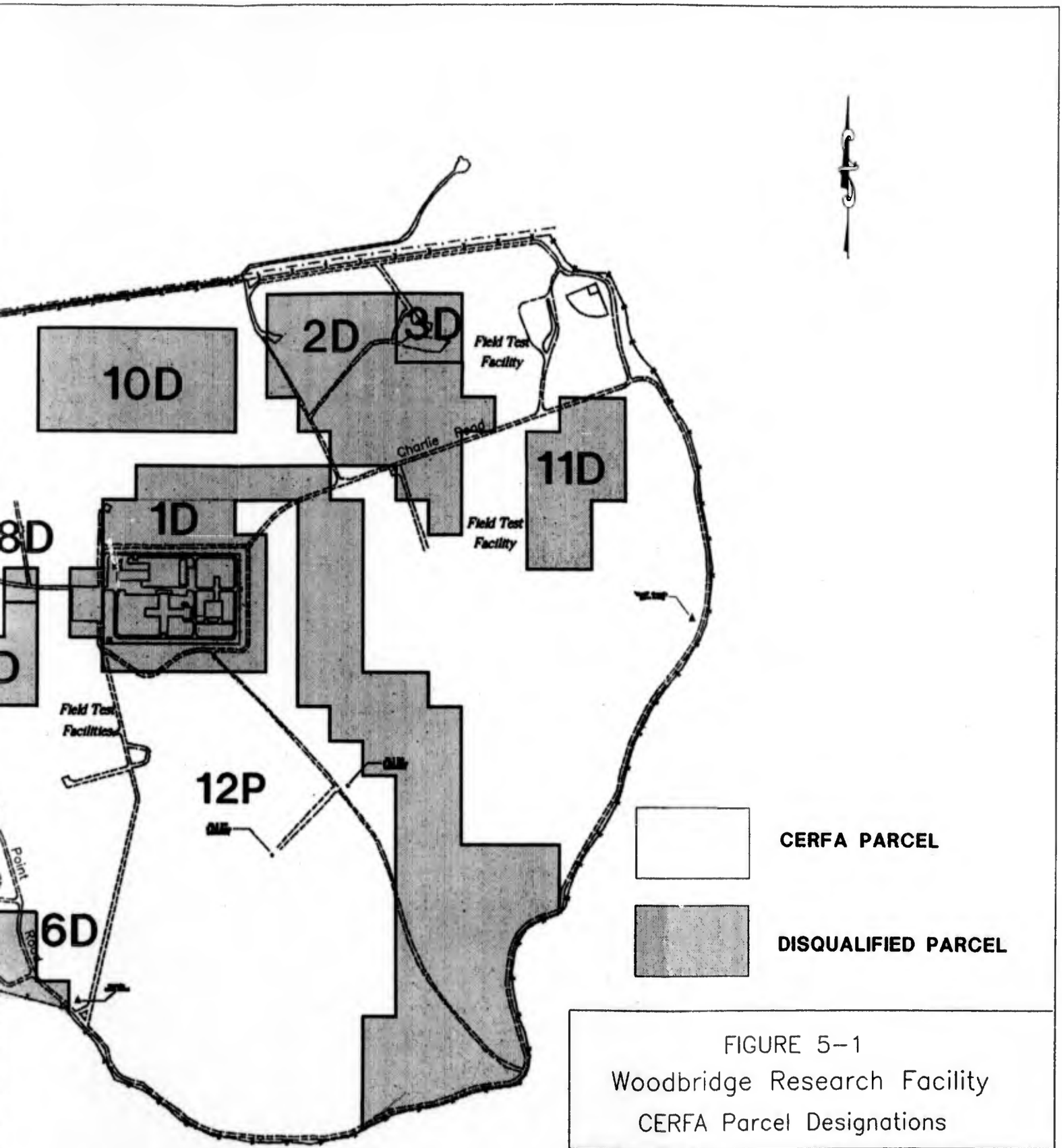
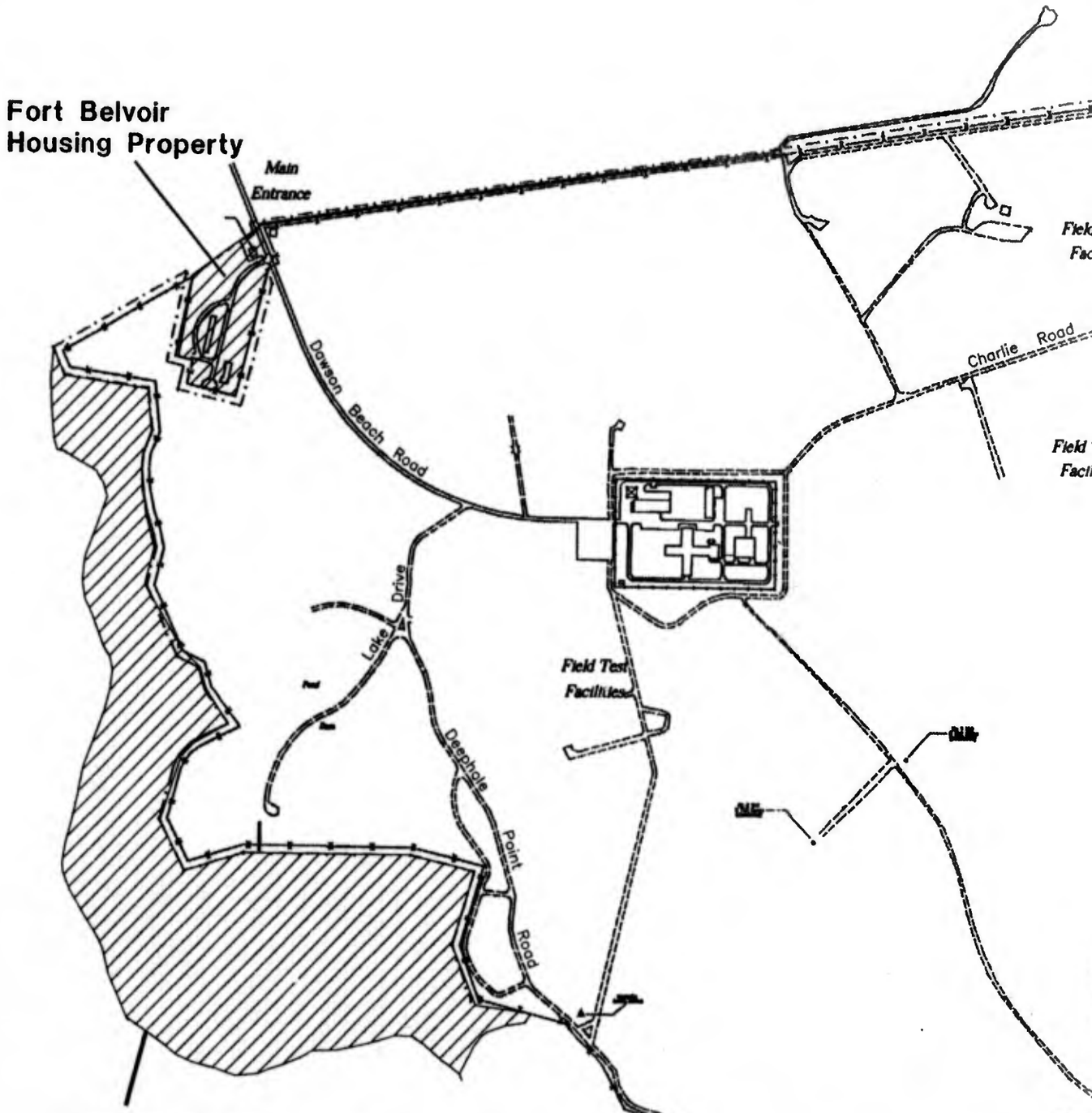
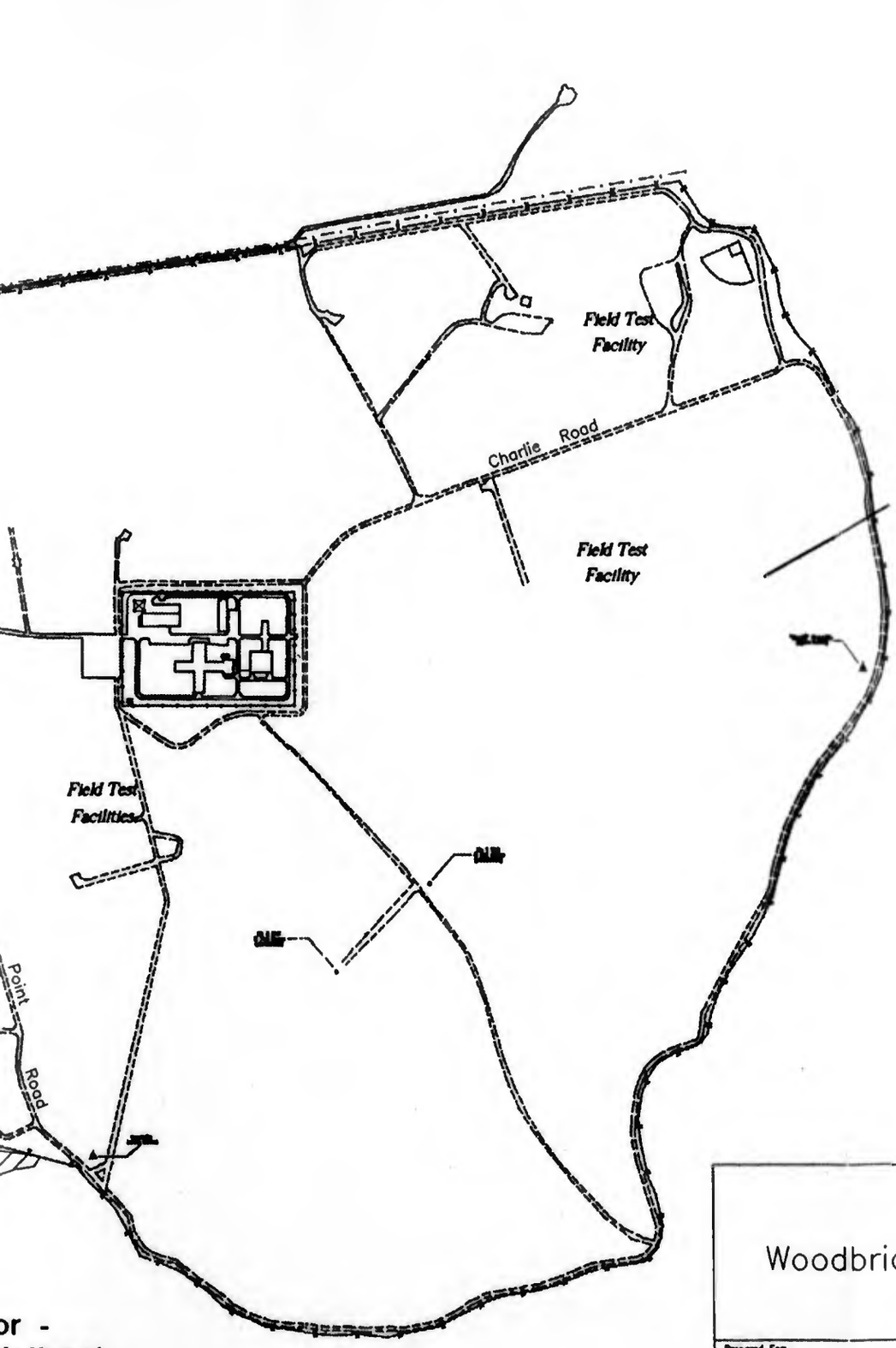


FIGURE 5-1
Woodbridge Research Facility
CERFA Parcel Designations

Prepared For:	Scale:
USAEC	AS SHOWN
Drawing No: 67070-008	Date: APR. 1994

Arthur D Little
Cambridge, Massachusetts


Fort Belvoir
Housing Property
Main
Entrance
Dawson Beach Road
Charlie Road
Lake Drive
Field Test
Facilities
Deephole
Point
Road
Excess 62.84 Acres,
Transferred to Dept. of Interior -
Dec. 1972, Marumsco Creek National
Wildlife Refuge
SCALE
0
1000 FT



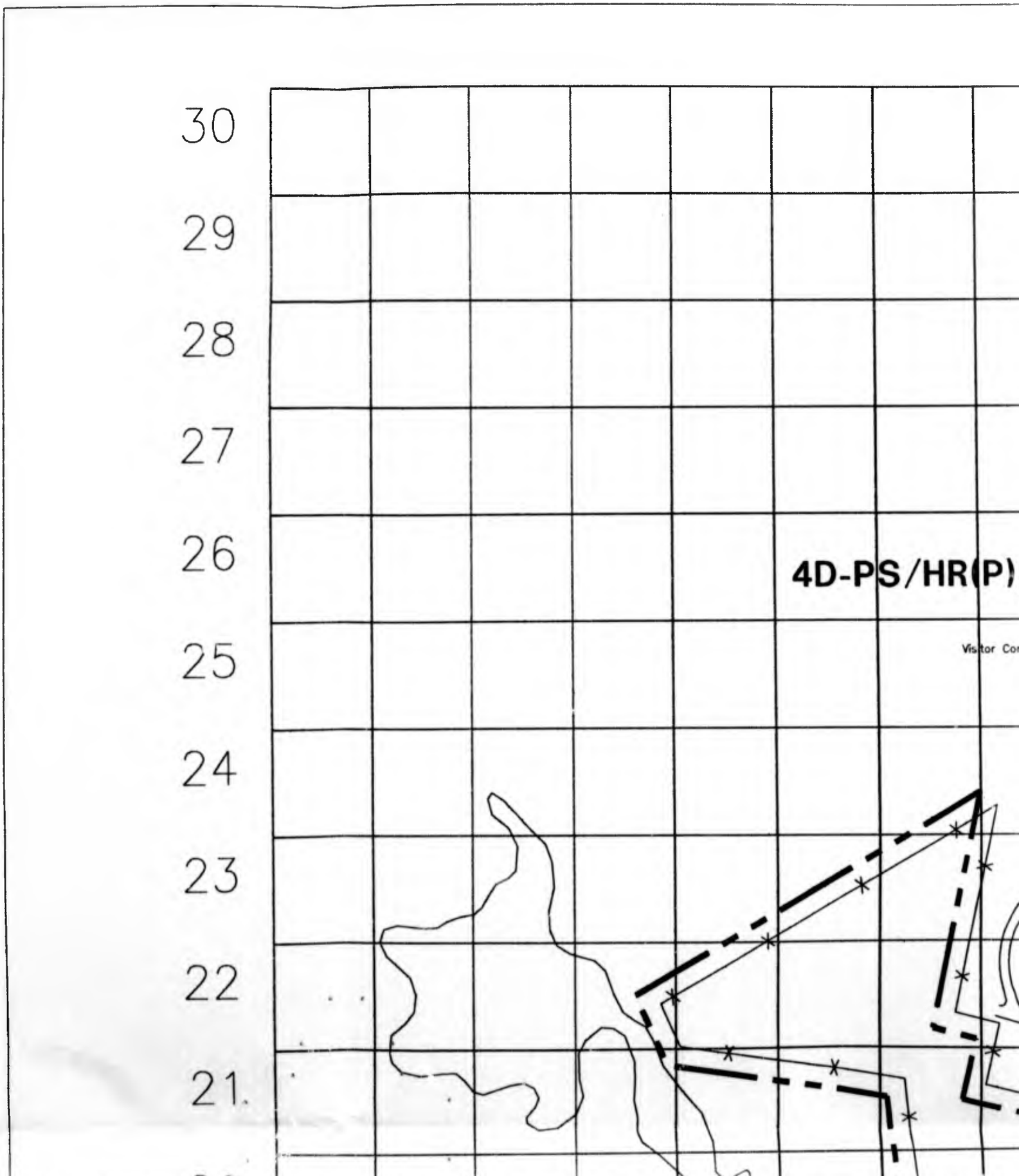
Woodbridge Research Facility (579 Acres)

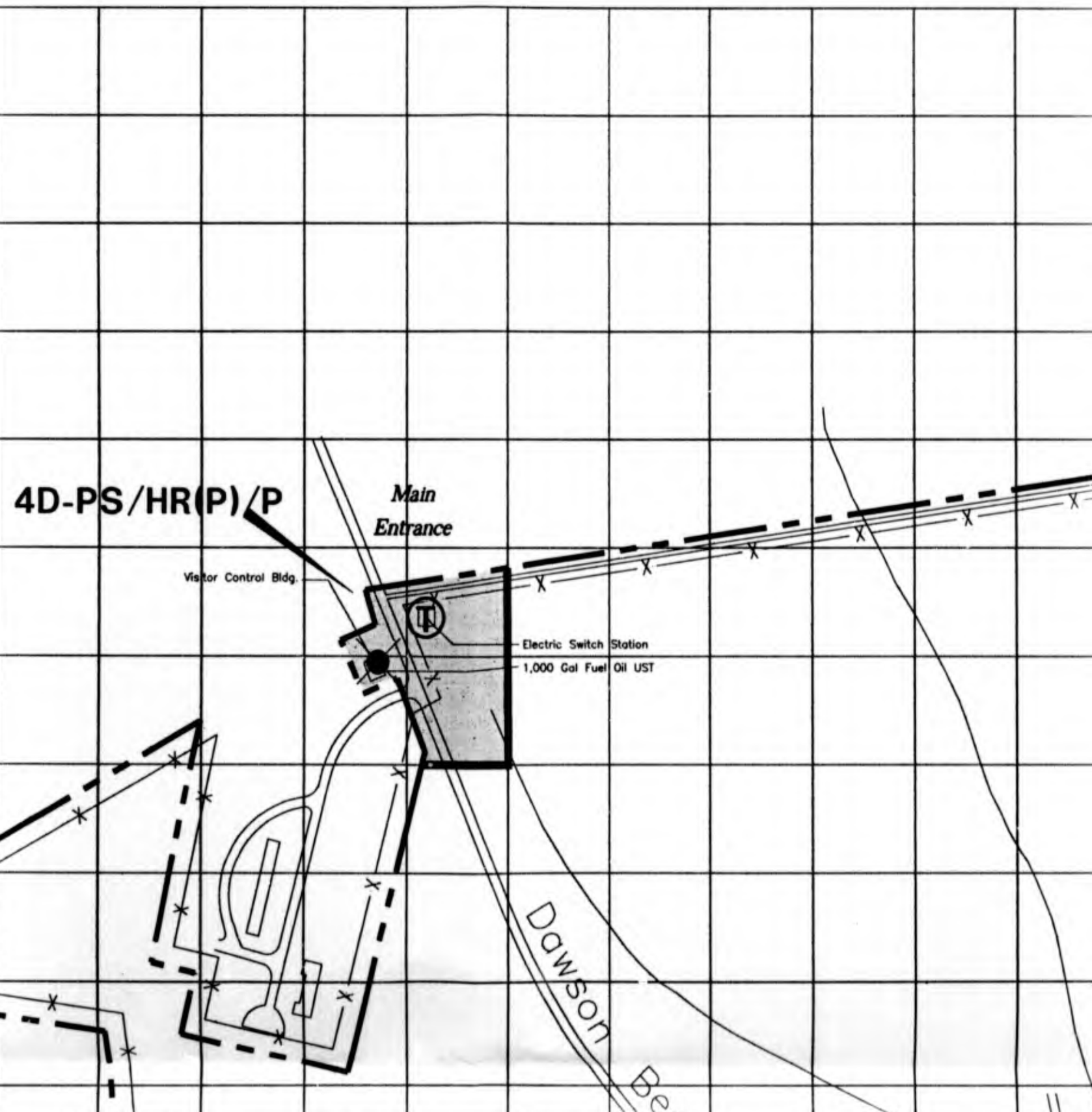
or -
National

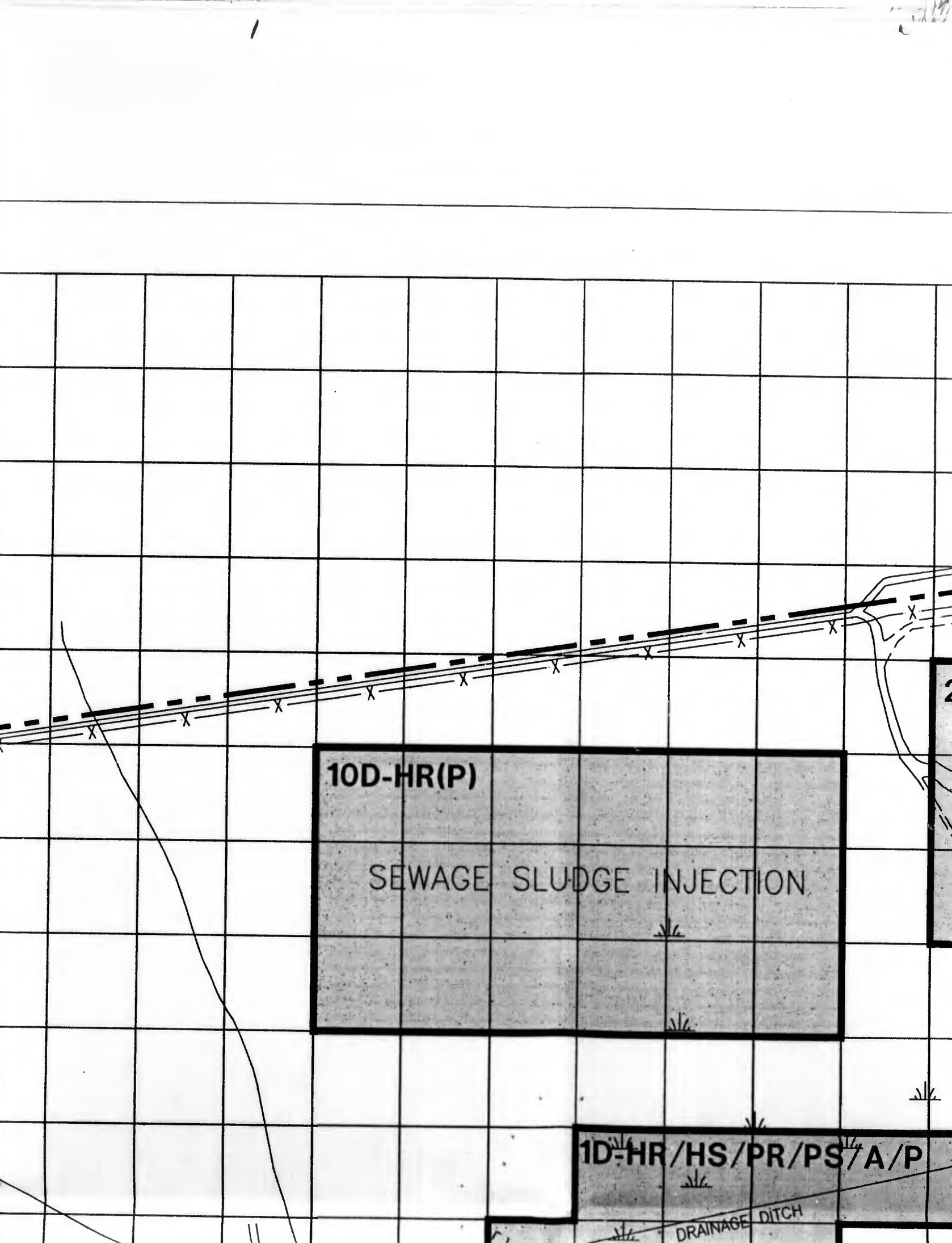
FIGURE 5–2
Woodbridge Research Facility
Tract Map

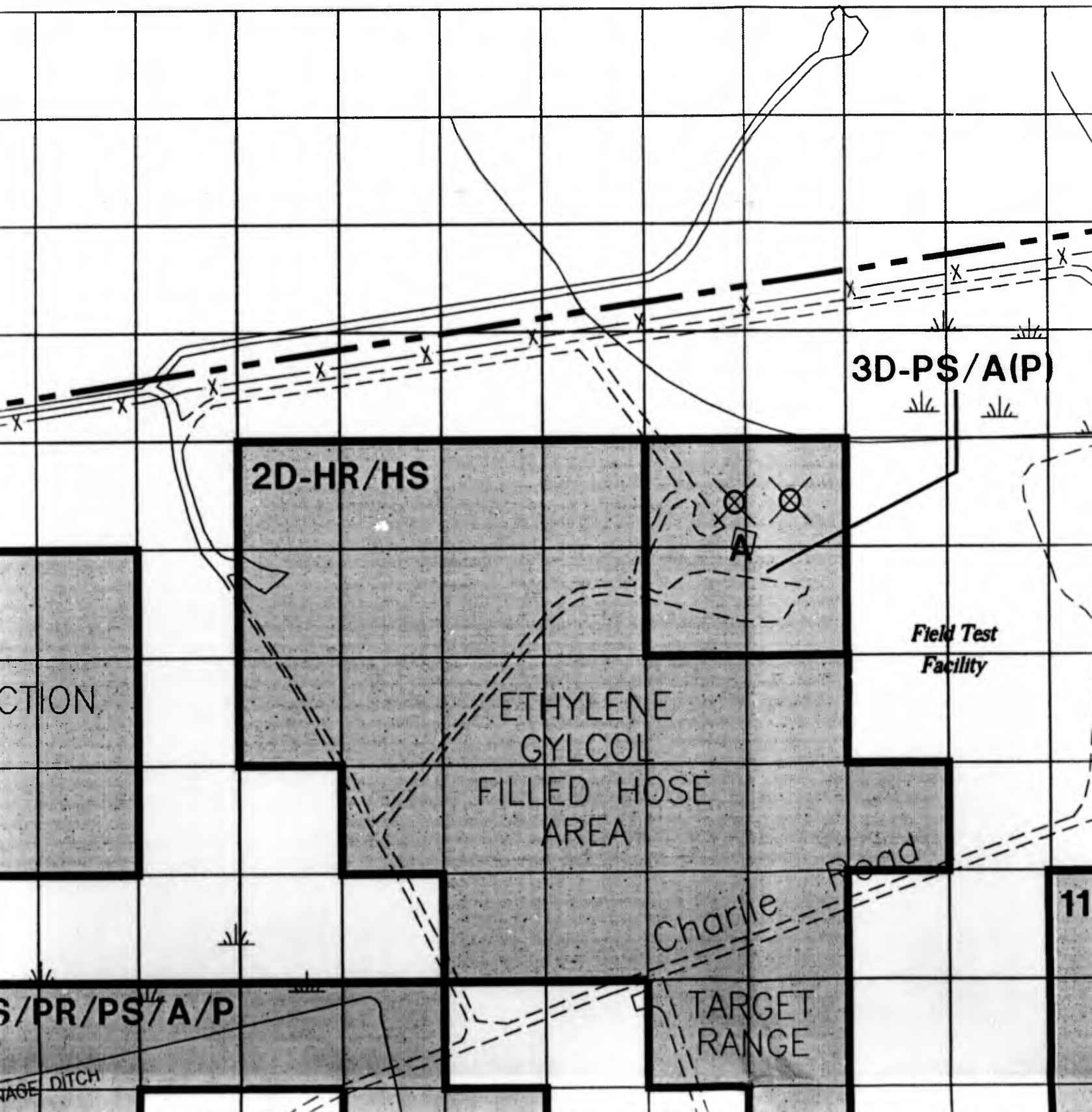
Prepared For:	Scale:
USAEC	AS SHOWN
Drawing No:	Date:
67070–008	APR. 1994

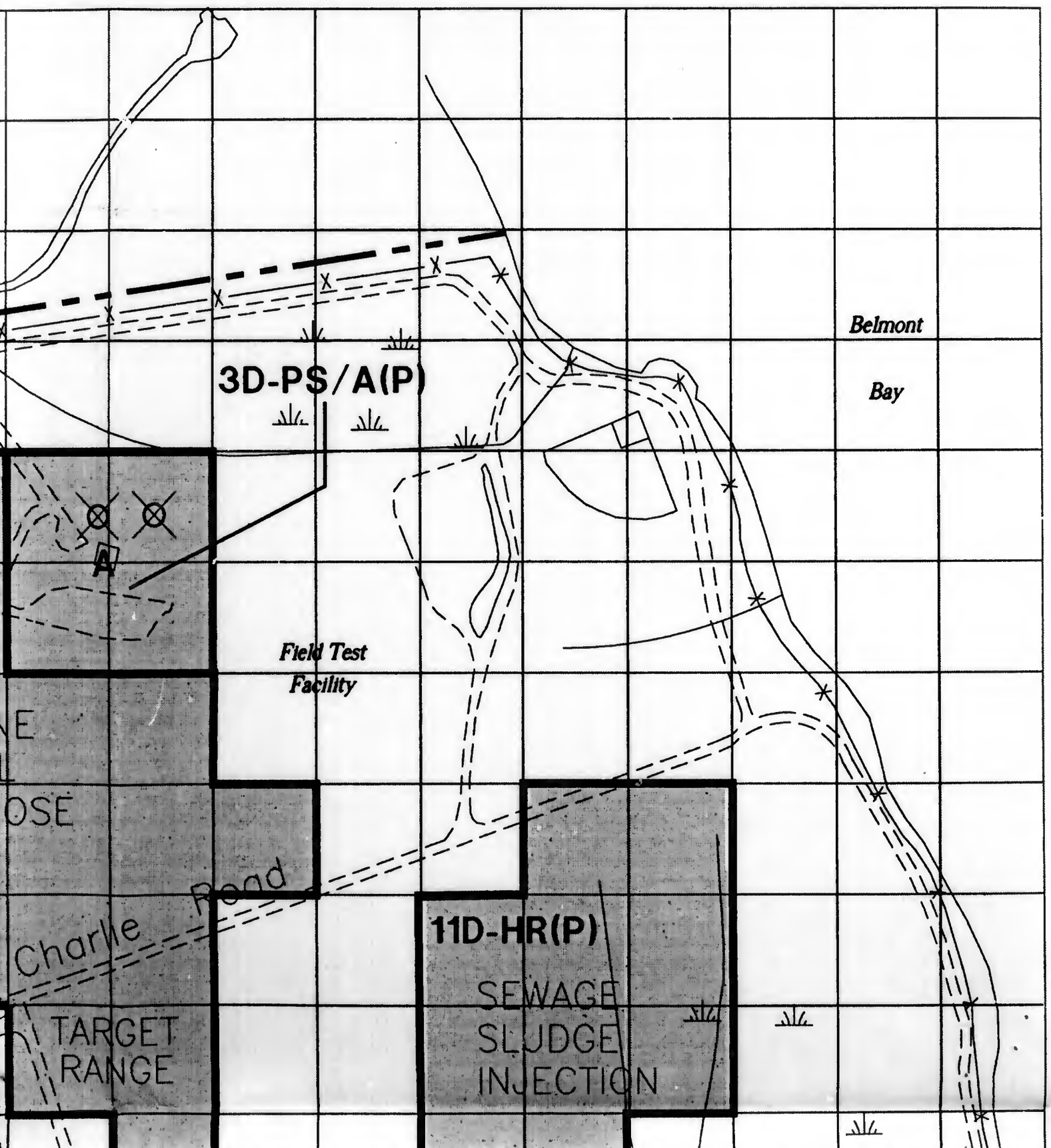
Arthur D Little
Cambridge, Massachusetts


30
29
28
27
26
25
24
23
22
21.
4D-PS/HR(P)
Visitor Co

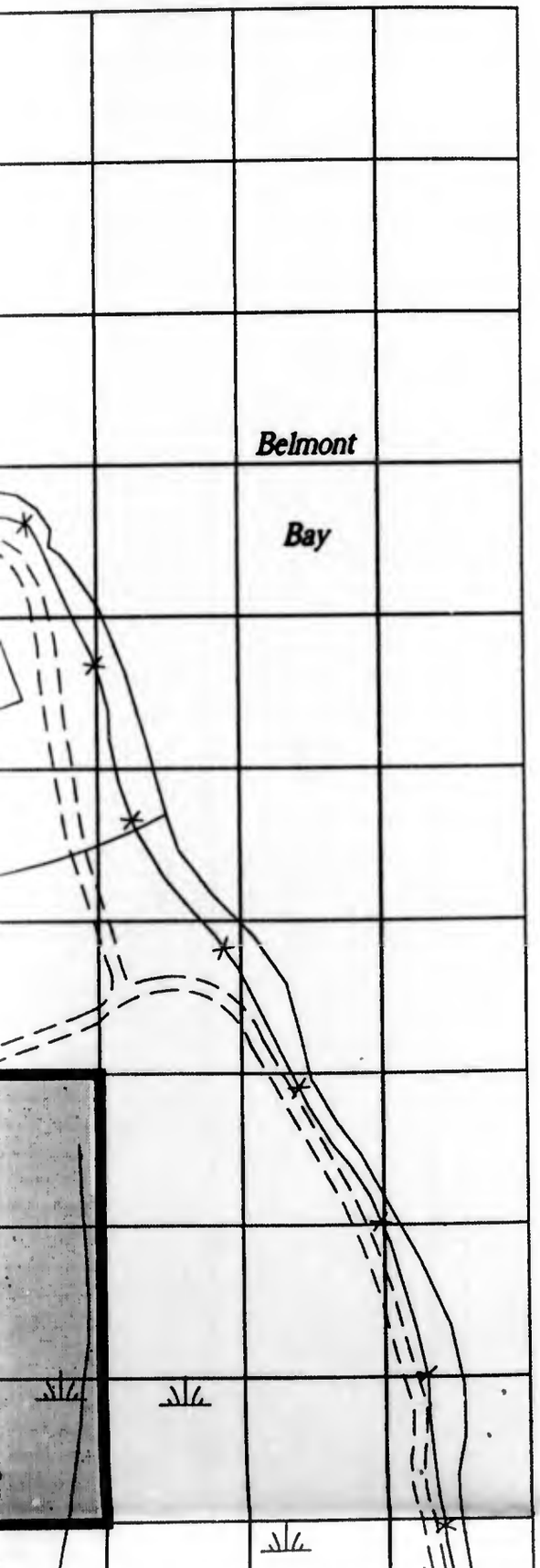

4D-PS/HR(P)/P
Main Entrance
Visitor Control Bldg.
Electric Switch Station
1,000 Gal Fuel Oil UST
Dawson


10D-HR(P)
SEWAGE SLUDGE INJECTION
1D-HR/HS/PR/PS/A/P
DRAINAGE DITCH

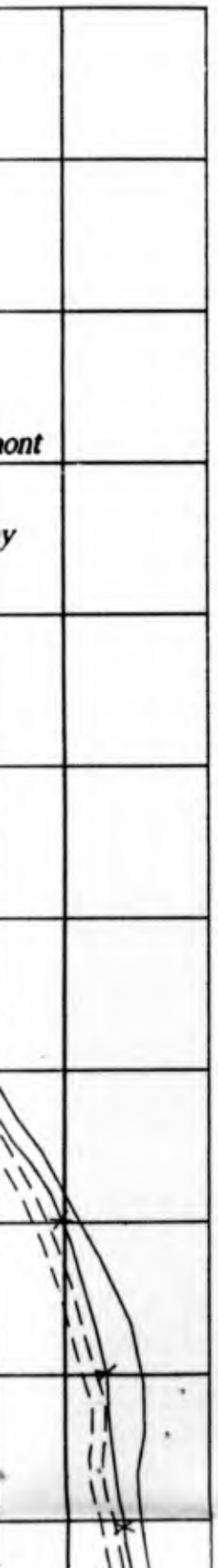

3D-PS/A(P)
2D-HR/HS
A
Field Test
Facility
CTION
ETHYLENE
GYLCOL
FILLED HOSE
AREA
Charlie Road
11
S/PR/PS/A/P
TARGET
RANGE
NAGE DITCH

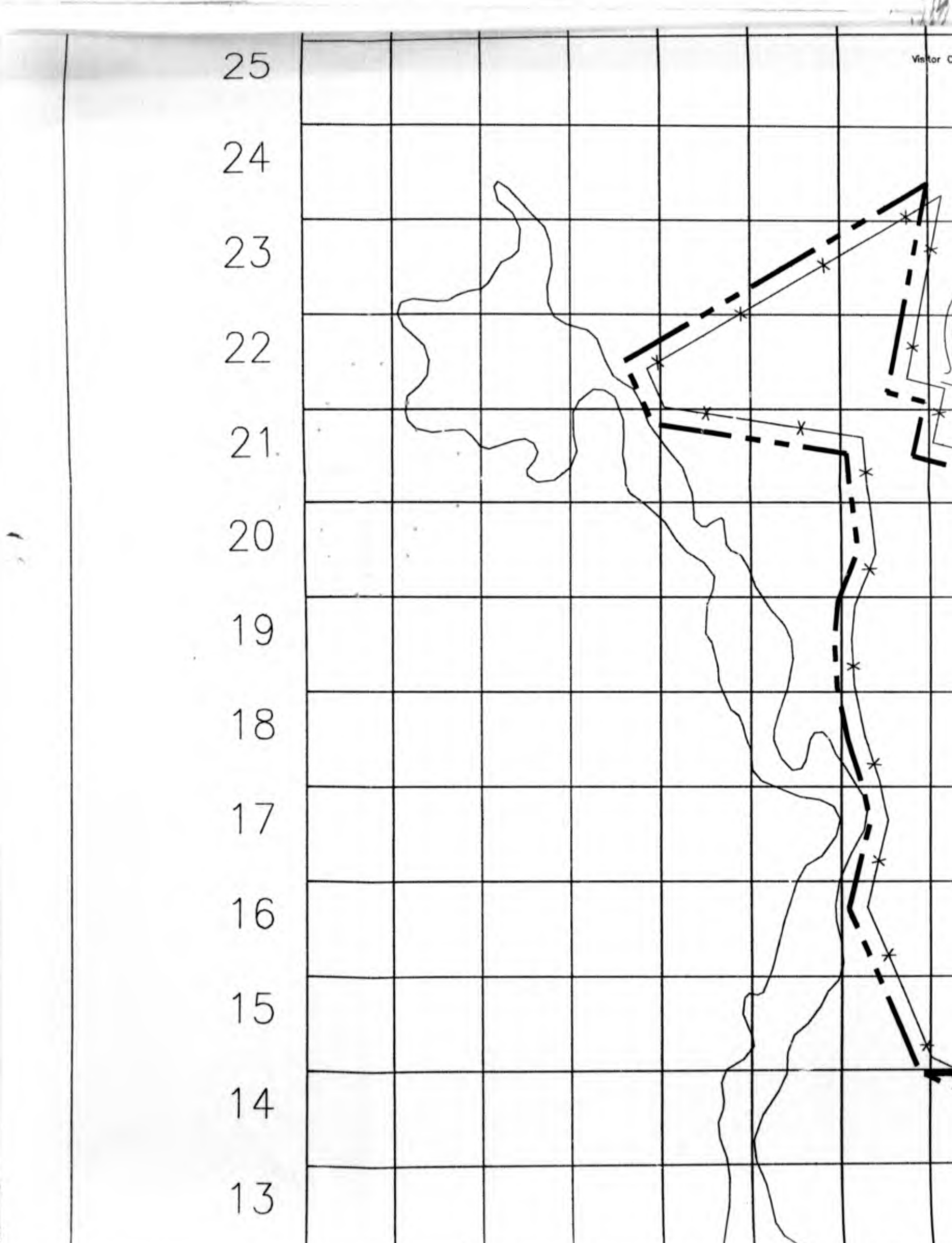

3D-PS/A(P)
Belmont
Bay
A
Field Test
Facility
E
OSE
Charlie
Road
11D-HR(P)
SEWAGE
SLUDGE
INJECTION
TARGET
RANGE

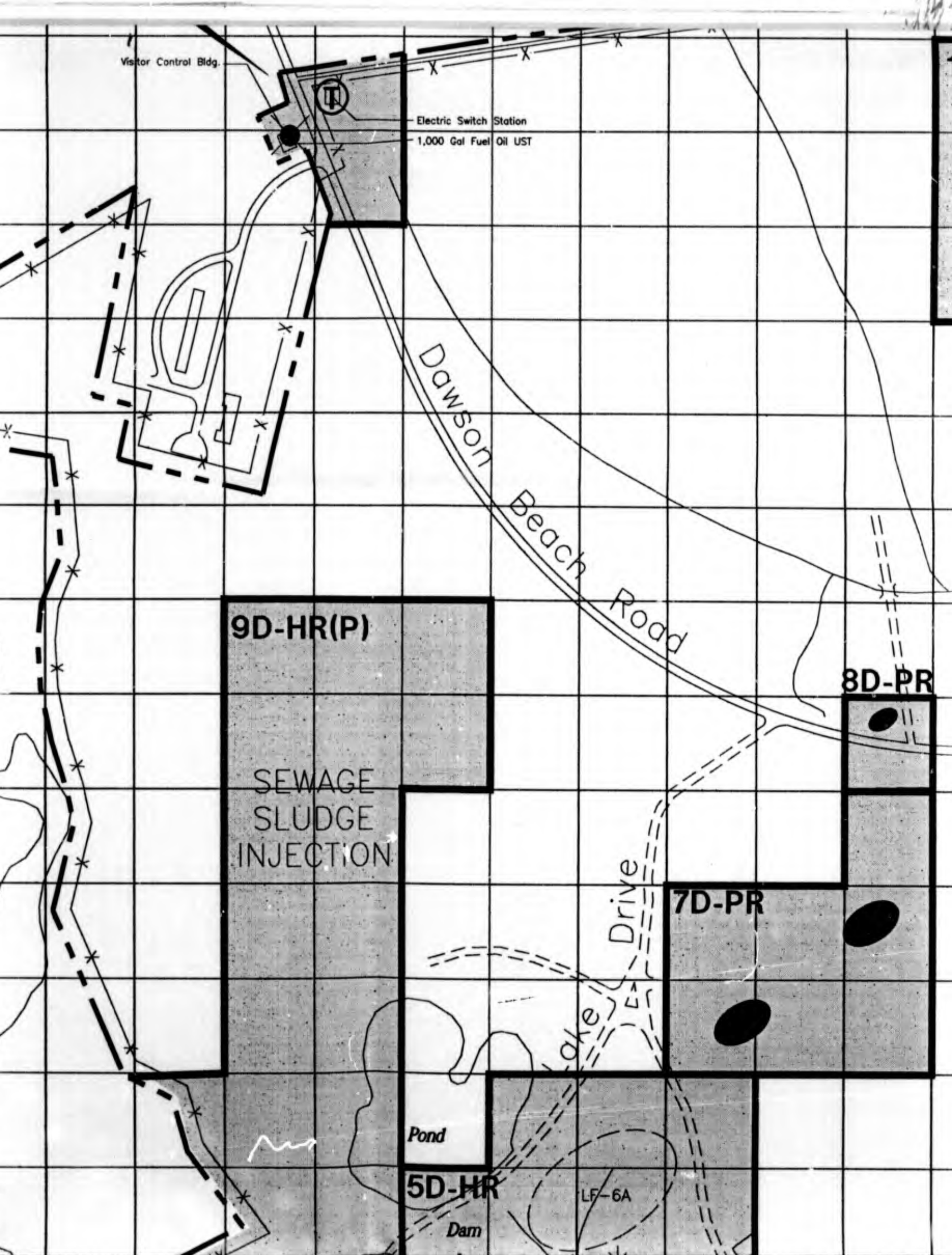
REV. #	REVISION DA
0	9/22/93
1	4/5/94

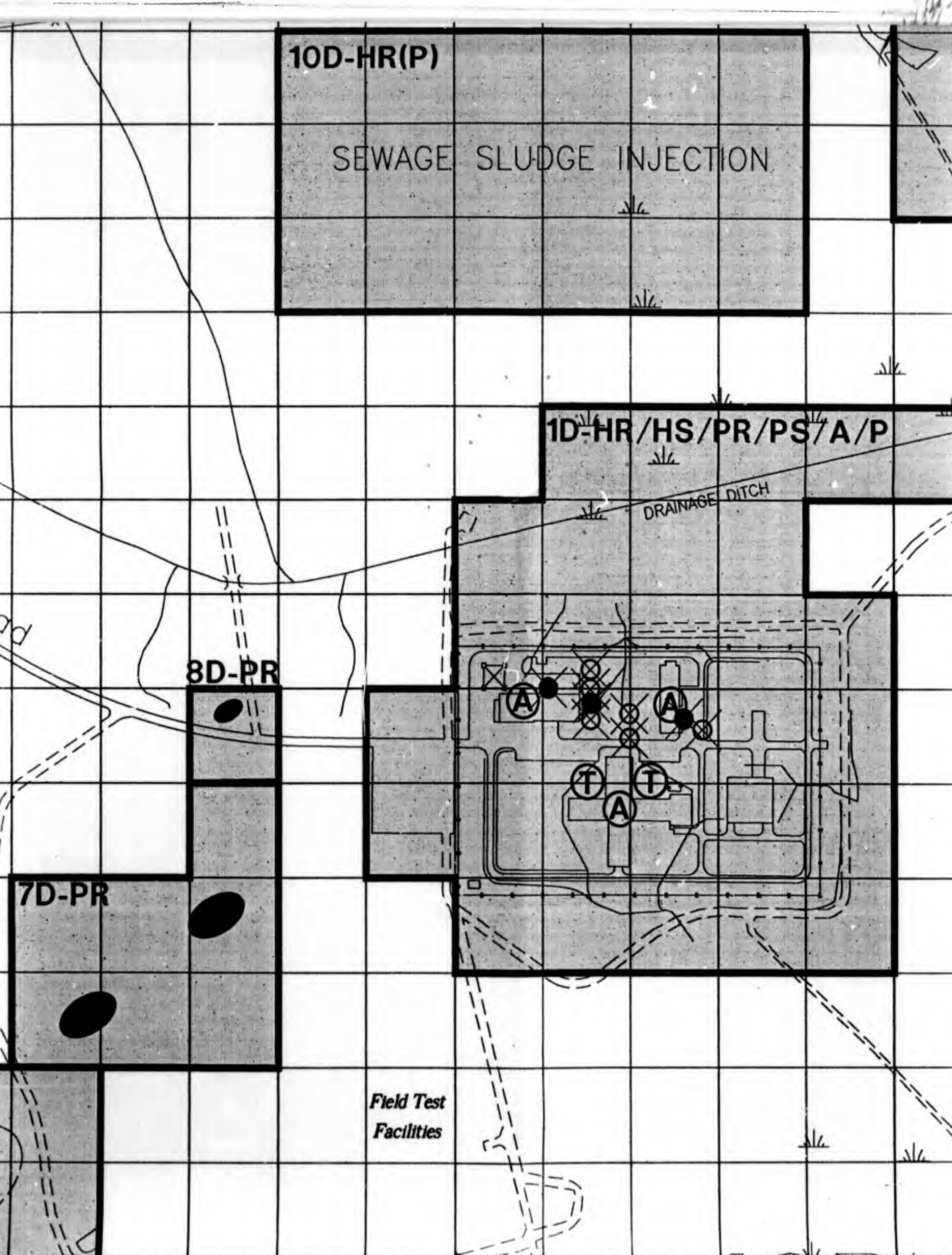


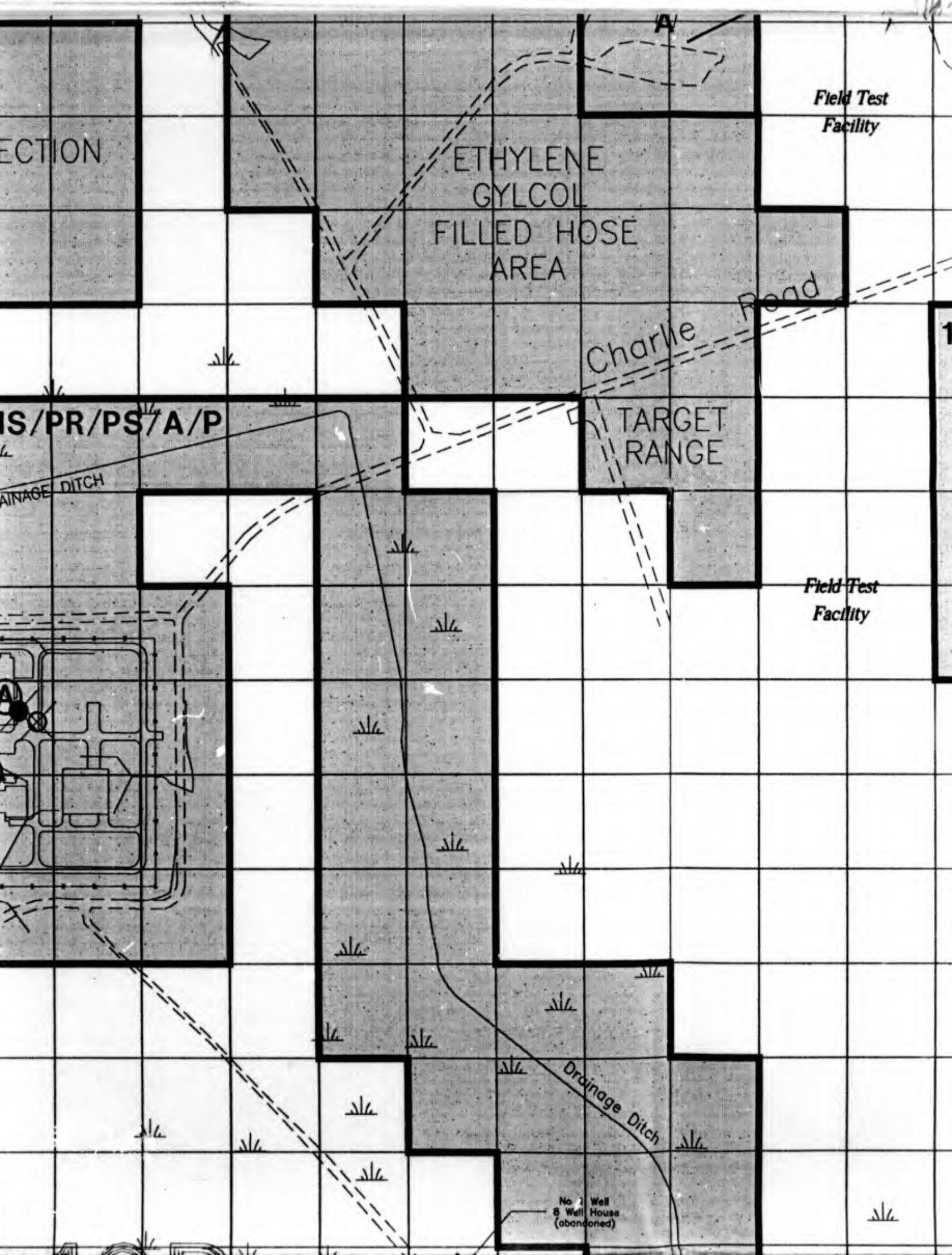
REV. #	REVISION DATE
0	9/22/93
1	4/5/94

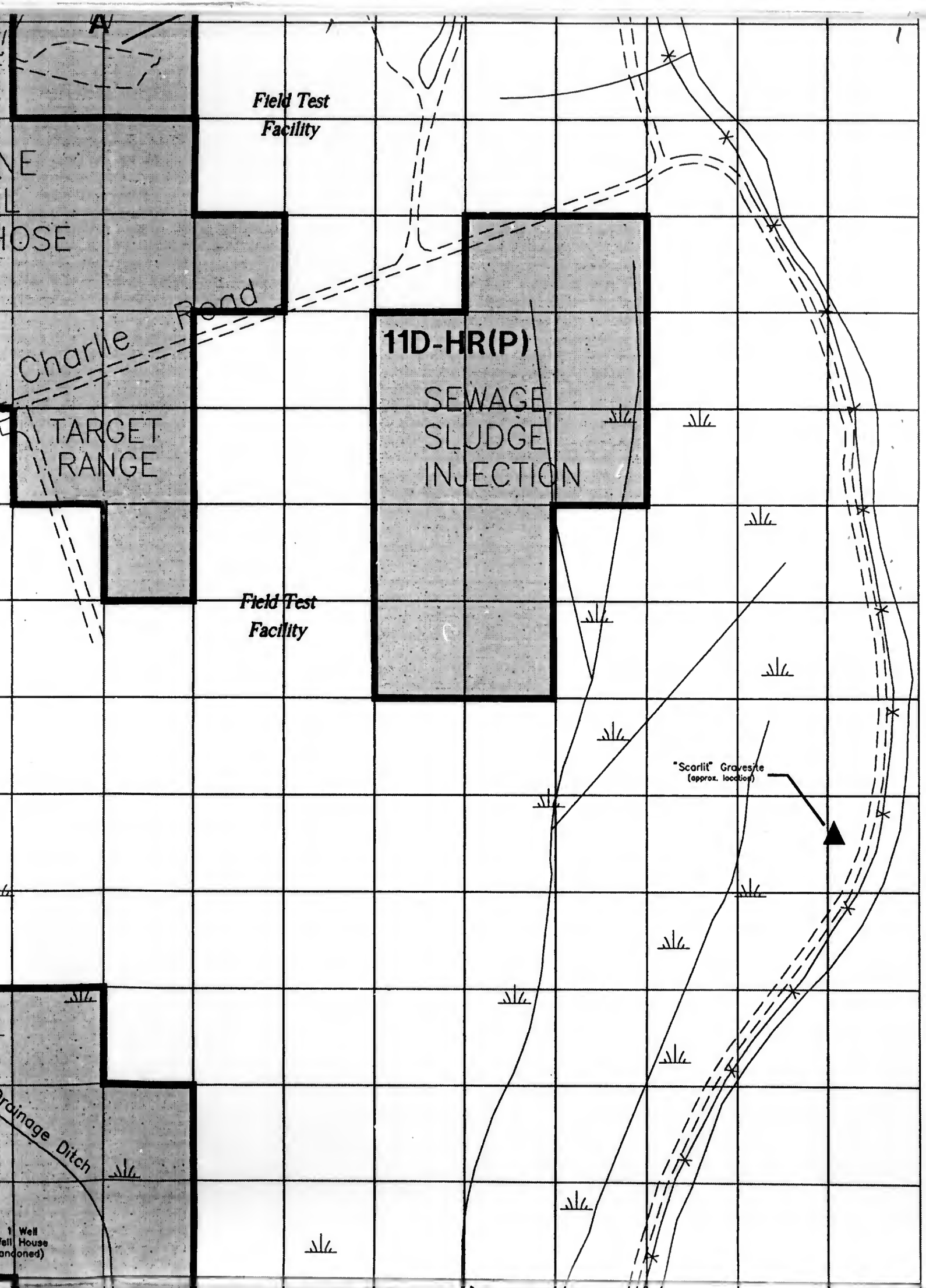


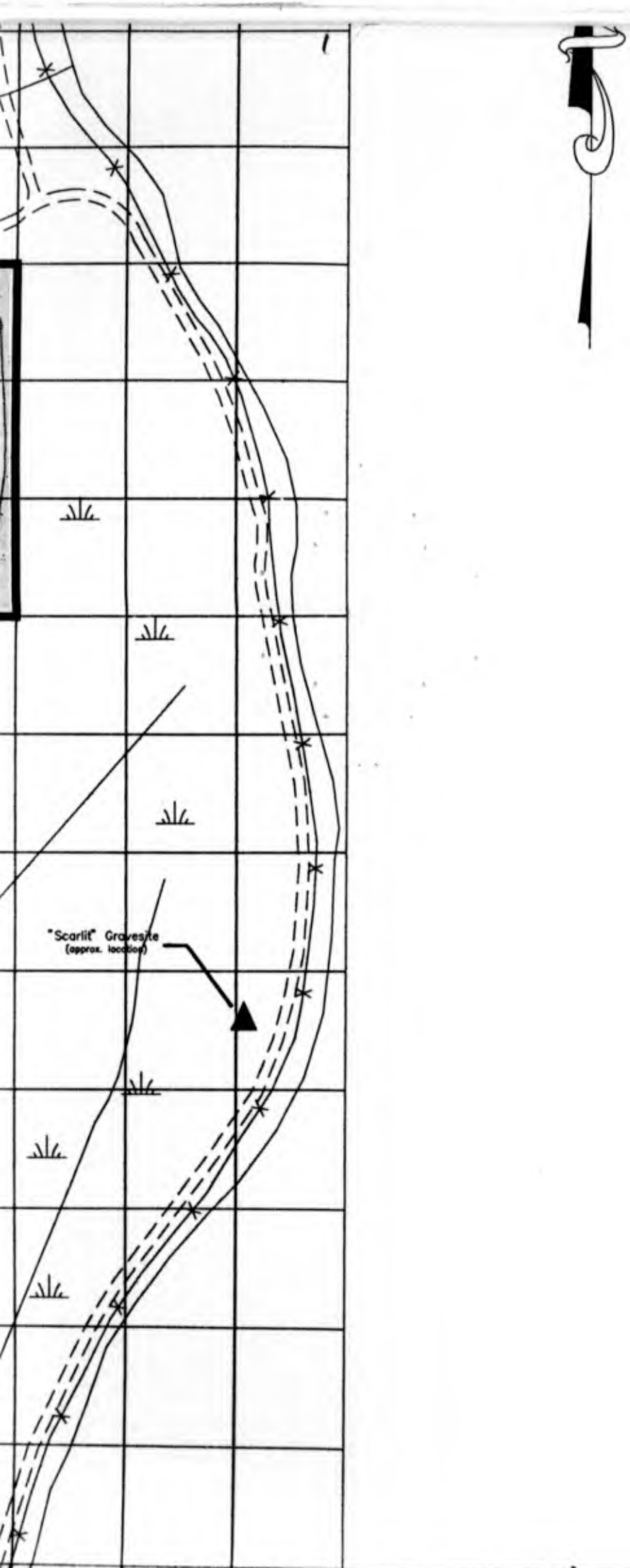

25
24
23
22
21
20
19
18
17
16
15
14
13

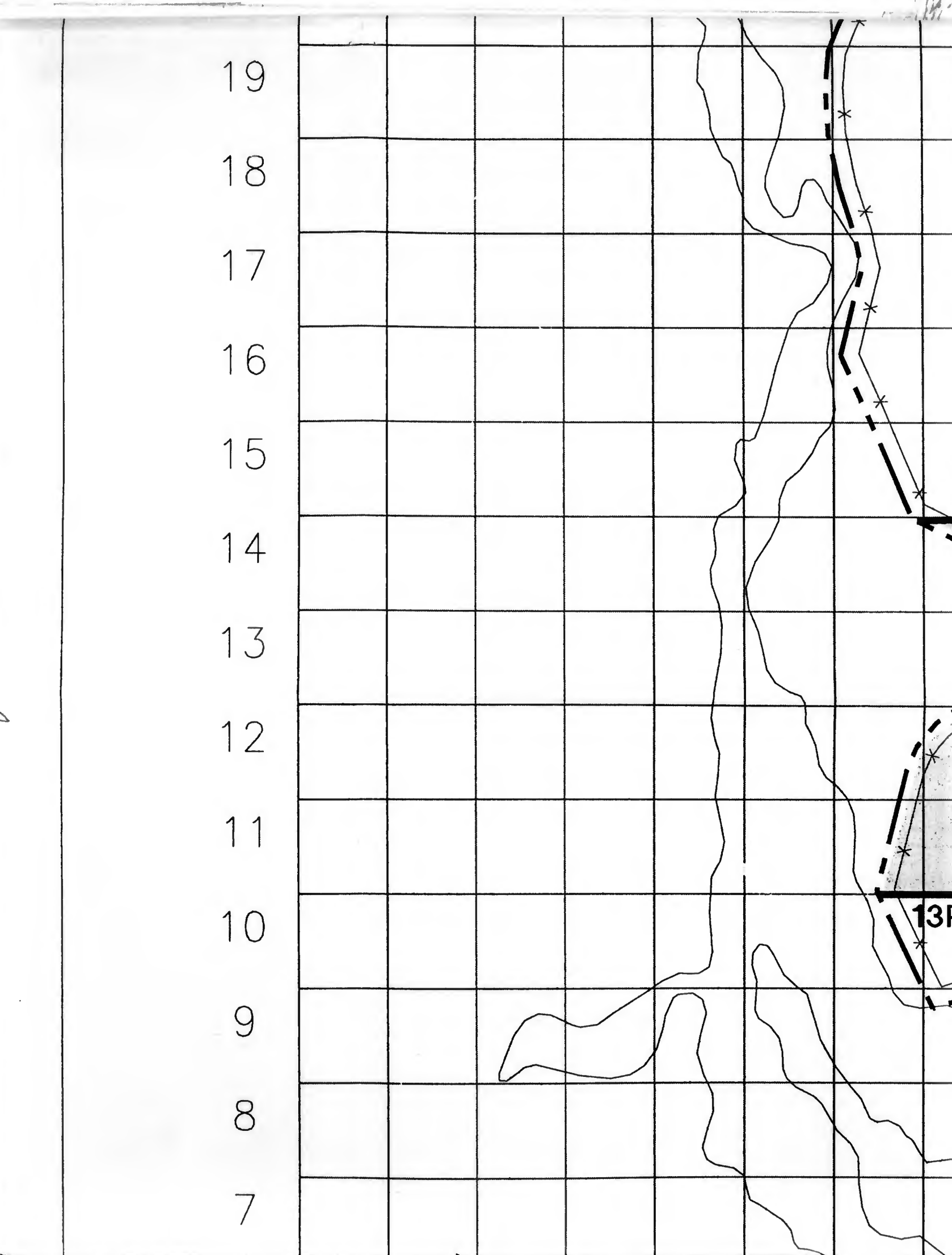

Visitor Control Bldg.
Electric Switch Station
1,000 Gal Fuel Oil UST
Dawson Beach Road
9D-HR(P)
SEWAGE SLUDGE INJECTION
8D-PR
7D-PR
Lake Drive
Pond
5D-HR
LF-6A
Dam


10D-HR(P)
SEWAGE SLUDGE INJECTION
1D-HR/HS/PR/PS/A/P
DRAINAGE DITCH
8D-PR
7D-PR
A
A
T
T
A
Field Test
Facilities

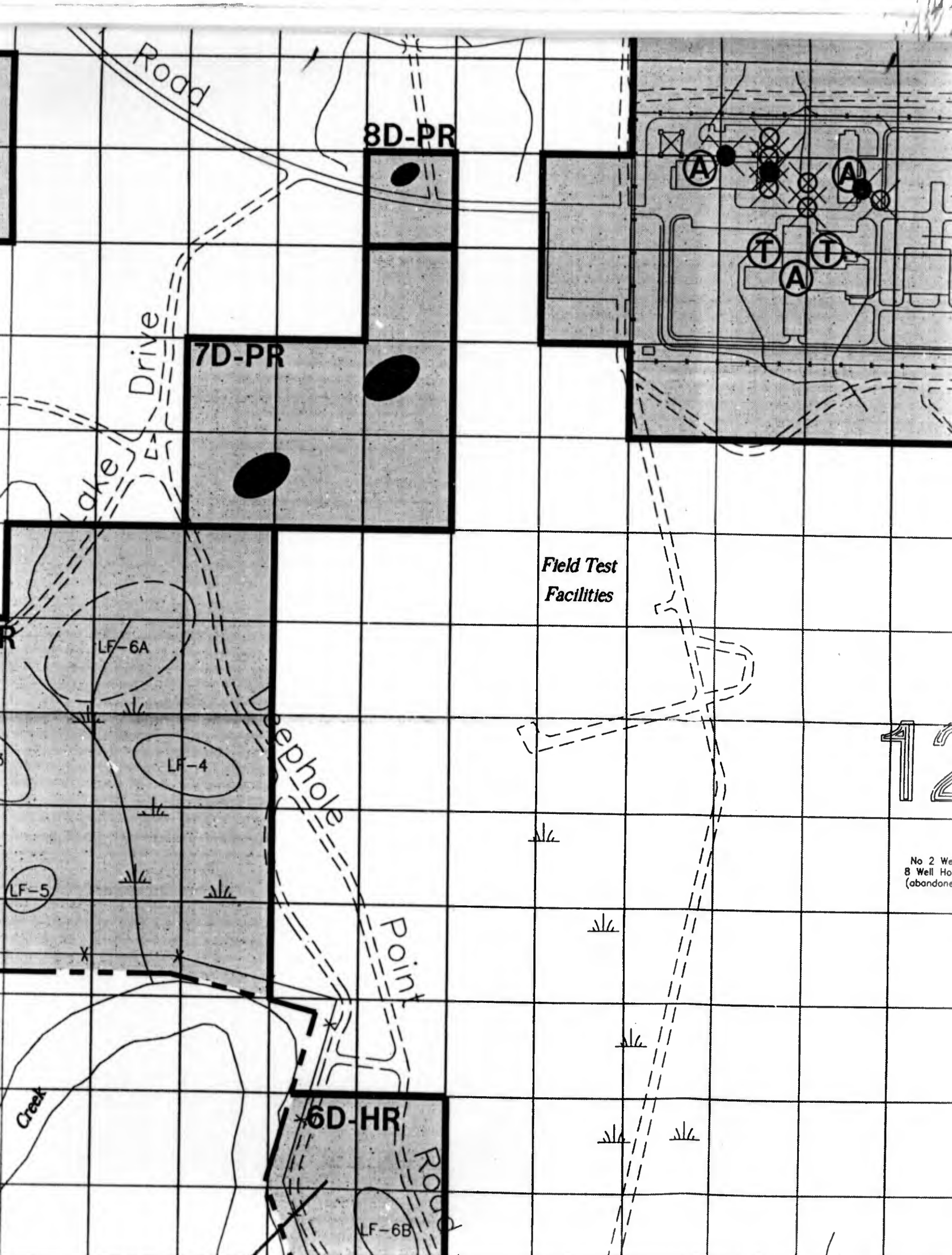

A
Field Test Facility
ECTION
ETHYLENE GYLCOL FILLED HOSE AREA
Charlie Road
TARGET RANGE
IS/PR/PS/A/P
AINAGE DITCH
Field Test Facility
Drainage Ditch
No. 1 Well & Well House (abandoned)

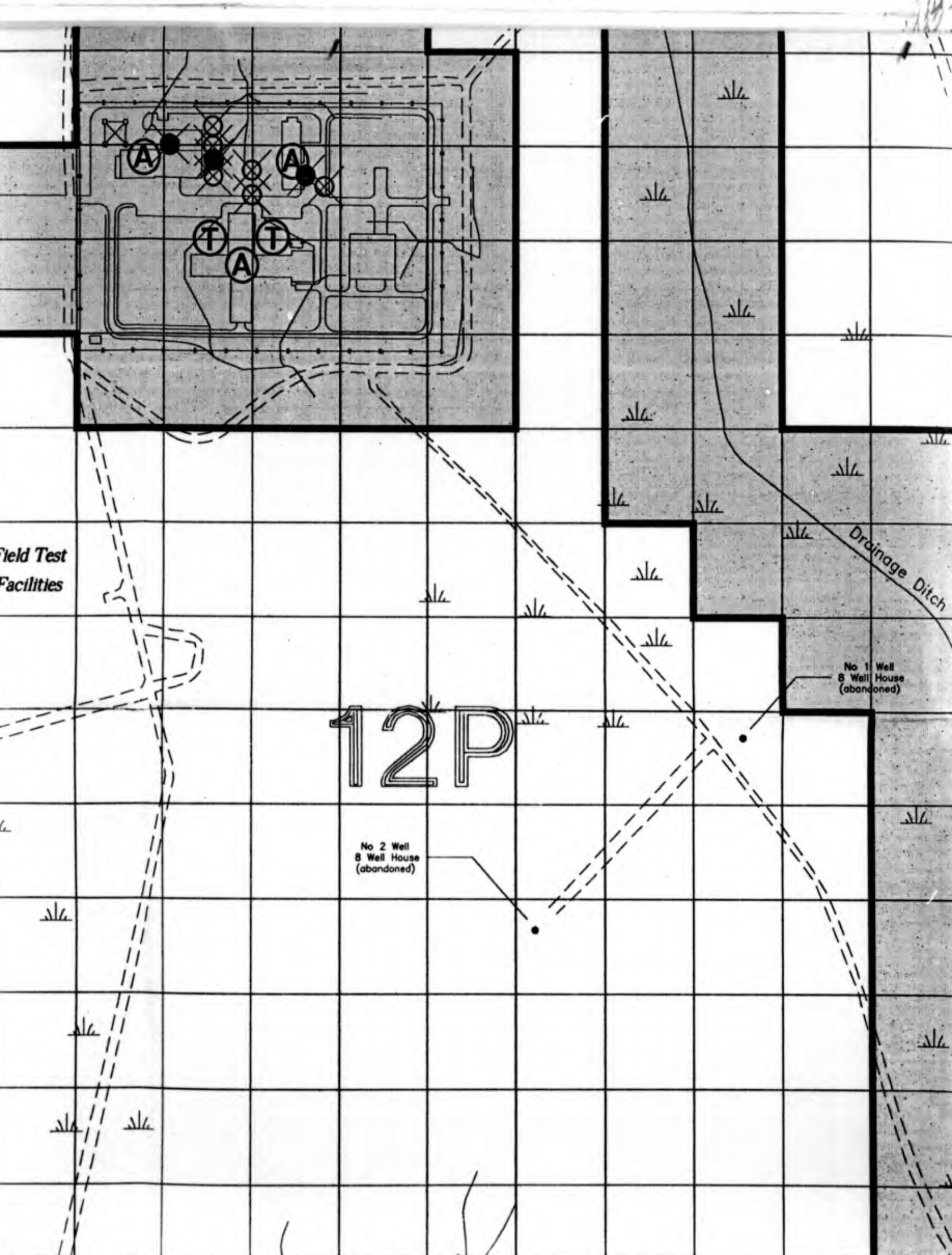

Field Test
Facility
Charlie Road
11D-HR(P)
SEWAGE
SLUDGE
INJECTION
TARGET
RANGE
Field Test
Facility
"Scarlit" Gravesite
(approx. location)
Drainage Ditch


"Scarlit" Gravesite
(approx. location)

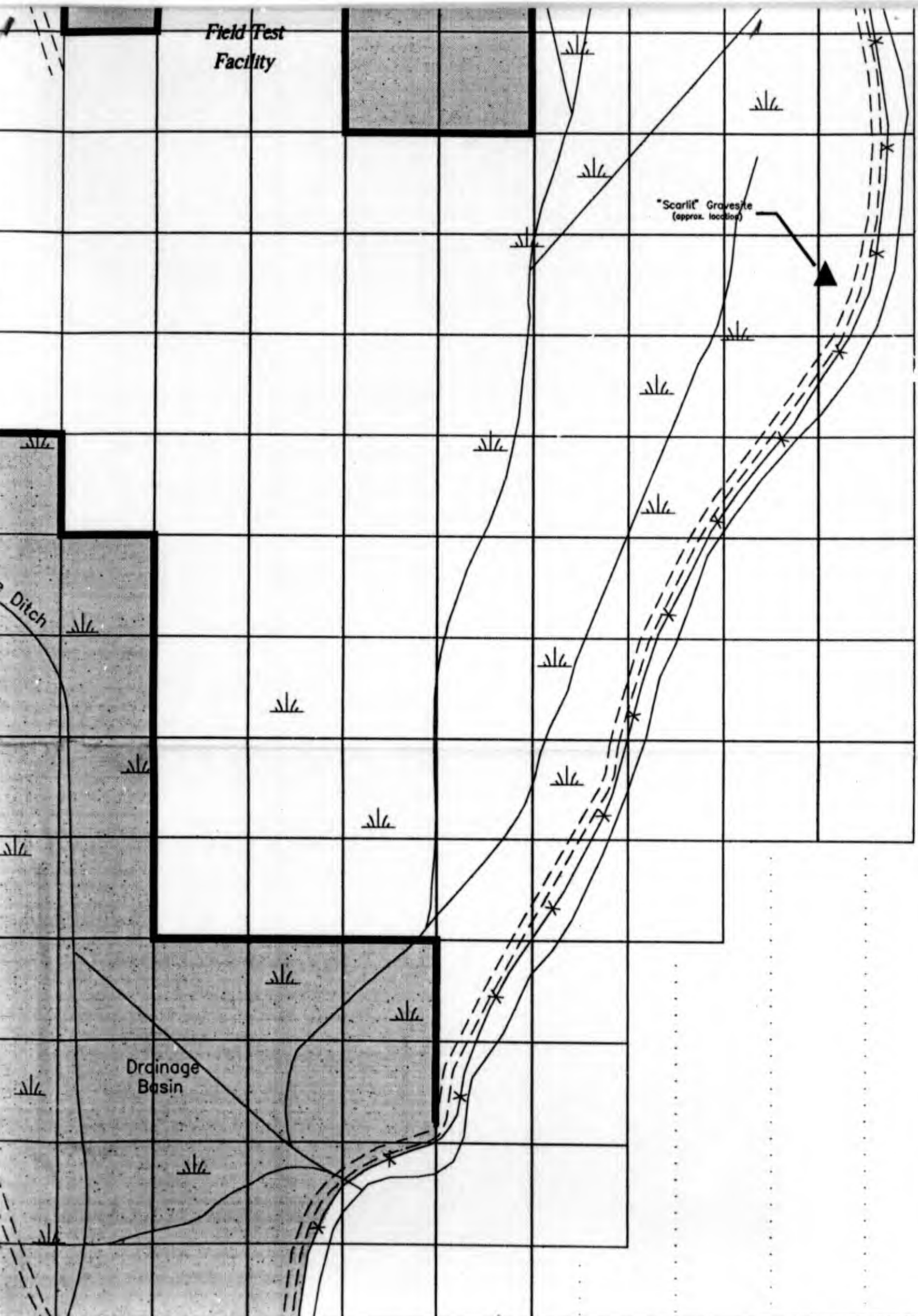

19
18
17
16
15
14
13
12
11
10
9
8
7

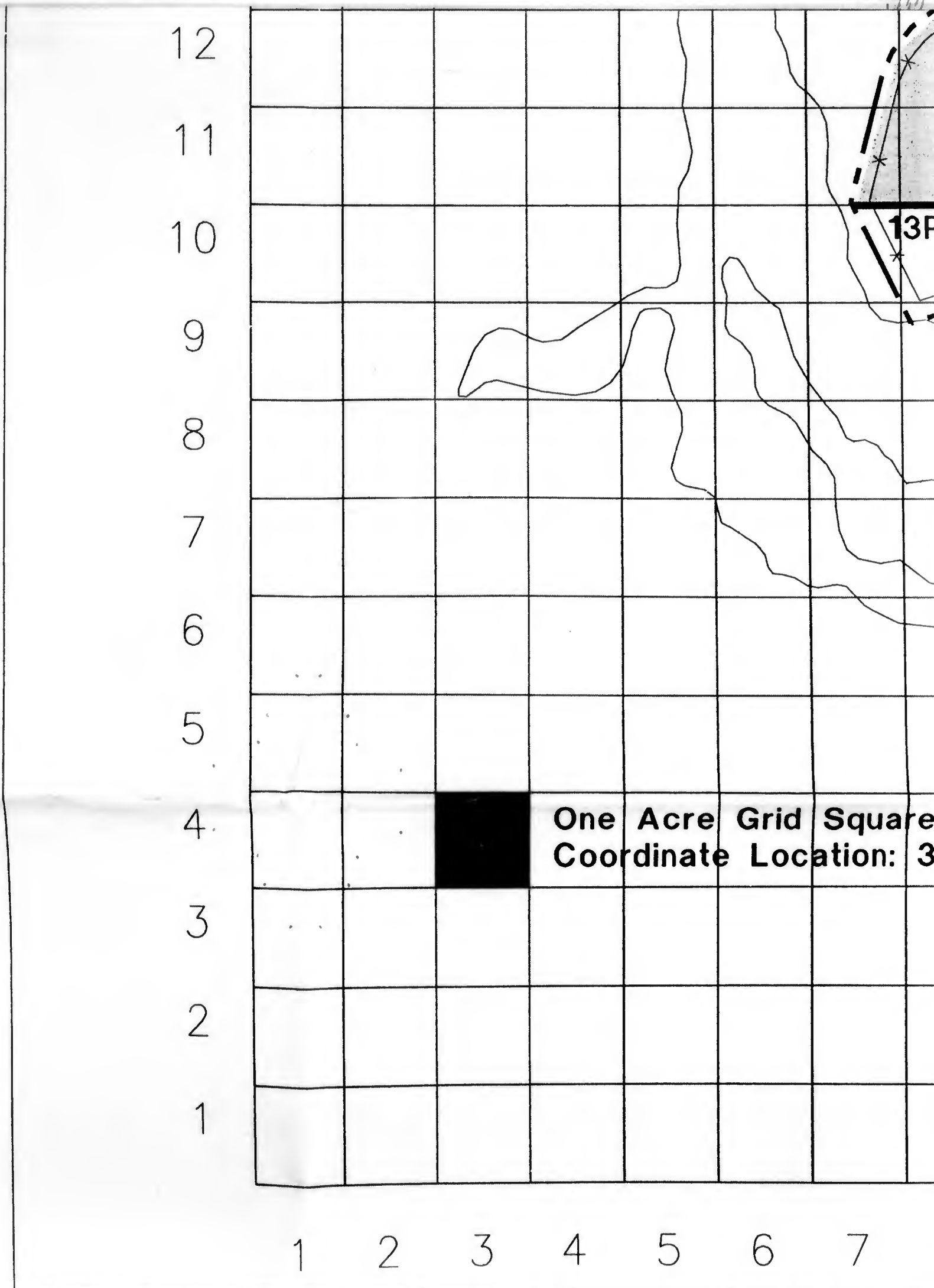

9D-HR(P)
SEWAGE
SLUDGE
INJECTION
Road
Drive
7D-PR
Lake
Pond
5D-HR
Dam
LF-6A
LF-3
LF-4
LF-2
LF-5
13P
Creek
6D

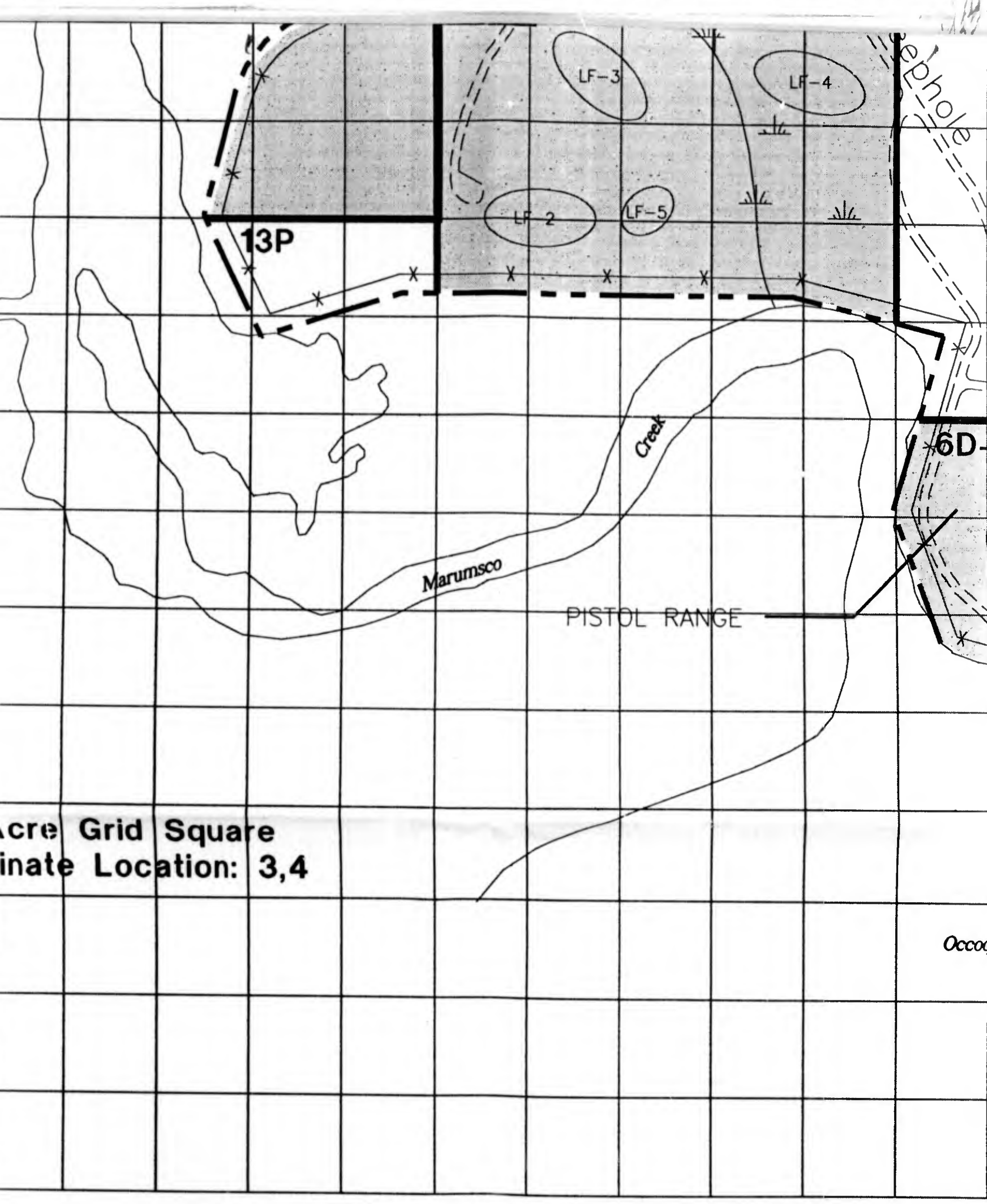

Road
8D-PR
7D-PR
Drive
Lake
Field Test
Facilities
LF-6A
LF-4
LF-5
Deephole
Point
Creek
6D-HR
LF-6B
No 2 We
8 Well Ho
(abandone


Field Test
Facilities
Drainage Ditch
No 1 Well
8 Well House
(abandoned)
12P
No 2 Well
8 Well House
(abandoned)

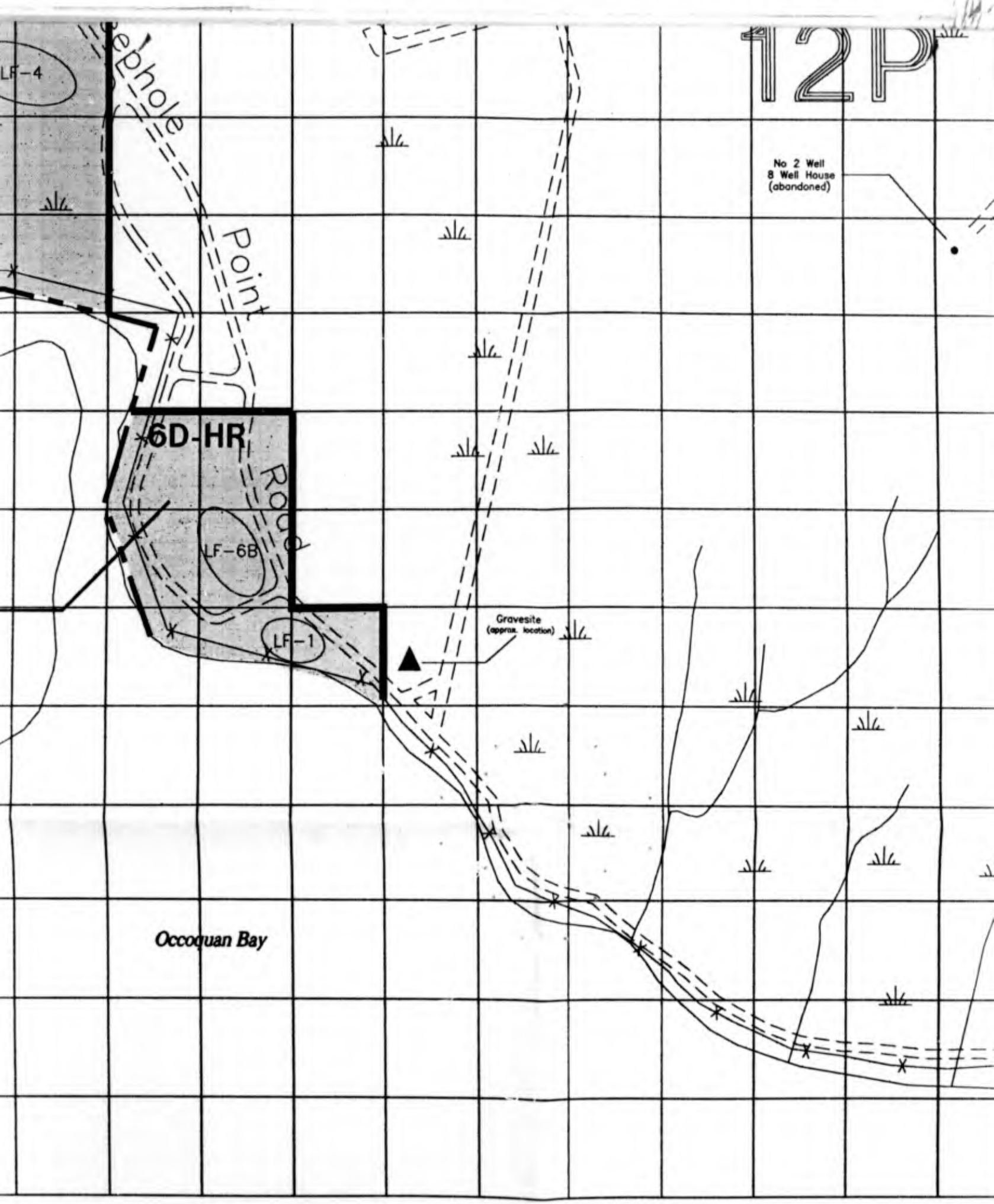

Field Test Facility
"Scarlit" Graveyard (approx. location)
Drainage Ditch
No 1 Well & Well House (abandoned)
Drainage Basin


Field Test
Facility
"Scarlit" Graveyard
(approx. location)
Ditch
Drainage
Basin

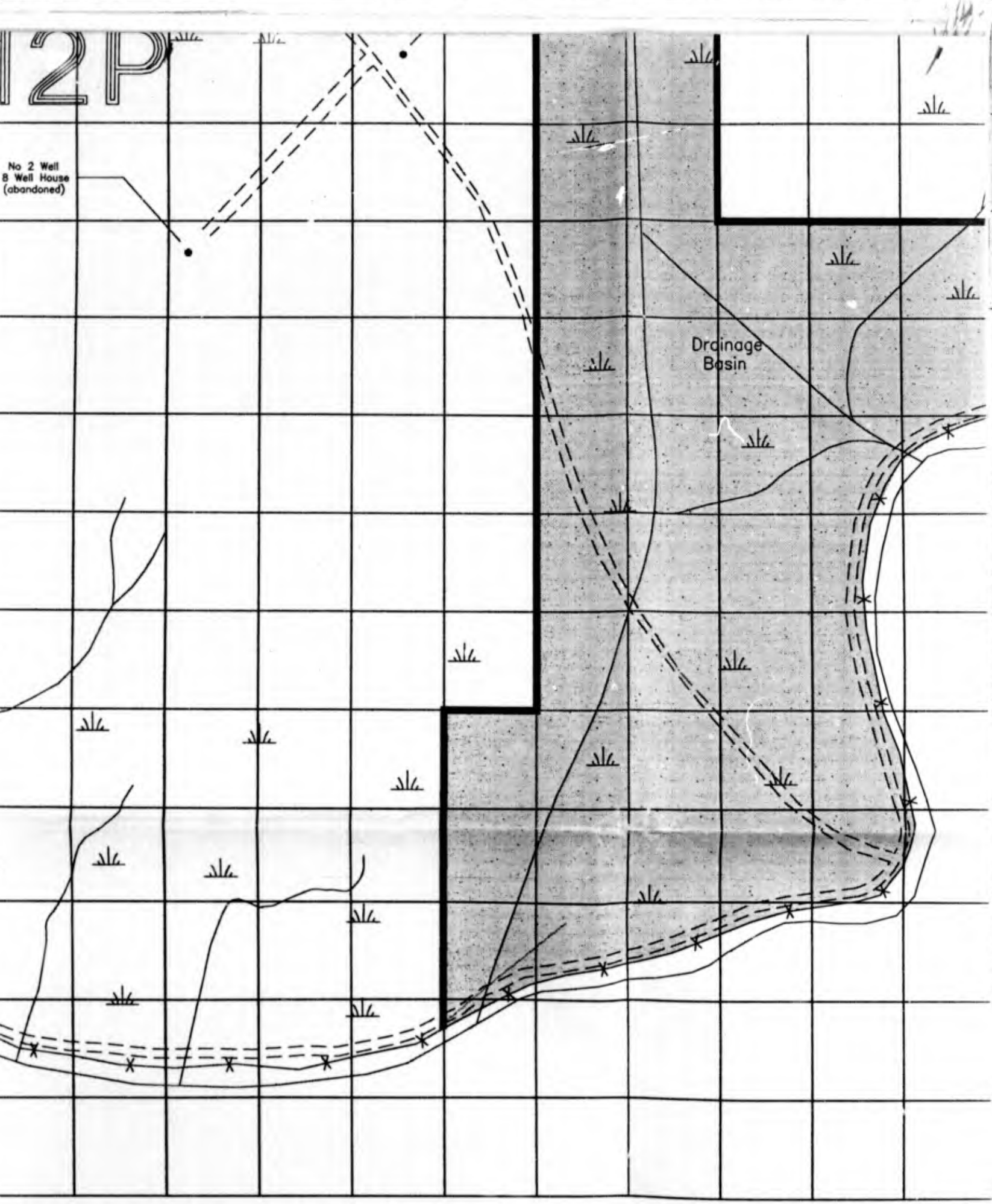

12
11
10
9
8
7
6
5
4
3
2
1
1 2 3 4 5 6 7
13P
One Acre Grid Square
Coordinate Location: 3



Acre Grid Square
inate Location: 3,4

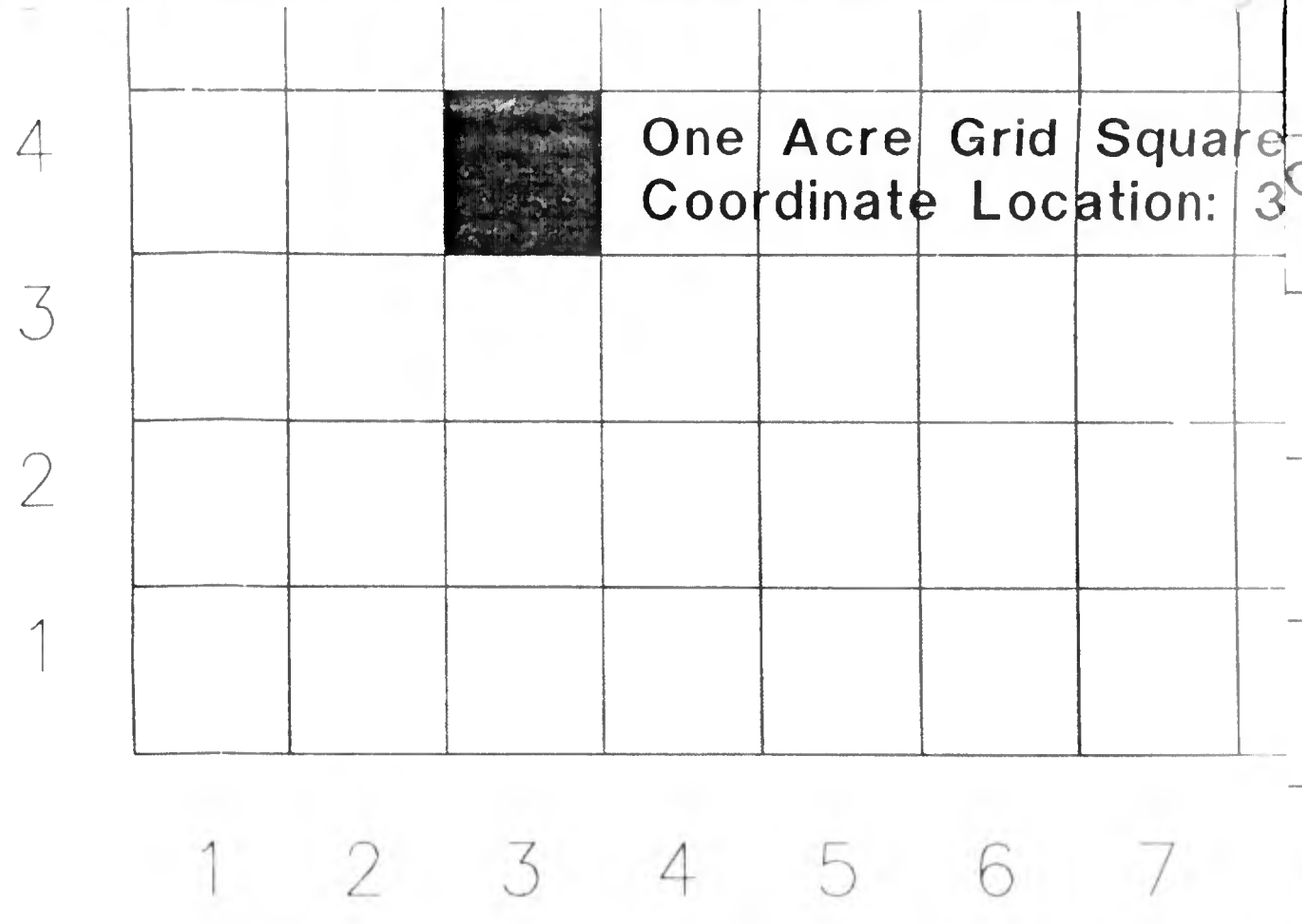


14 15 16 17 18 19 20 21 22 23 24



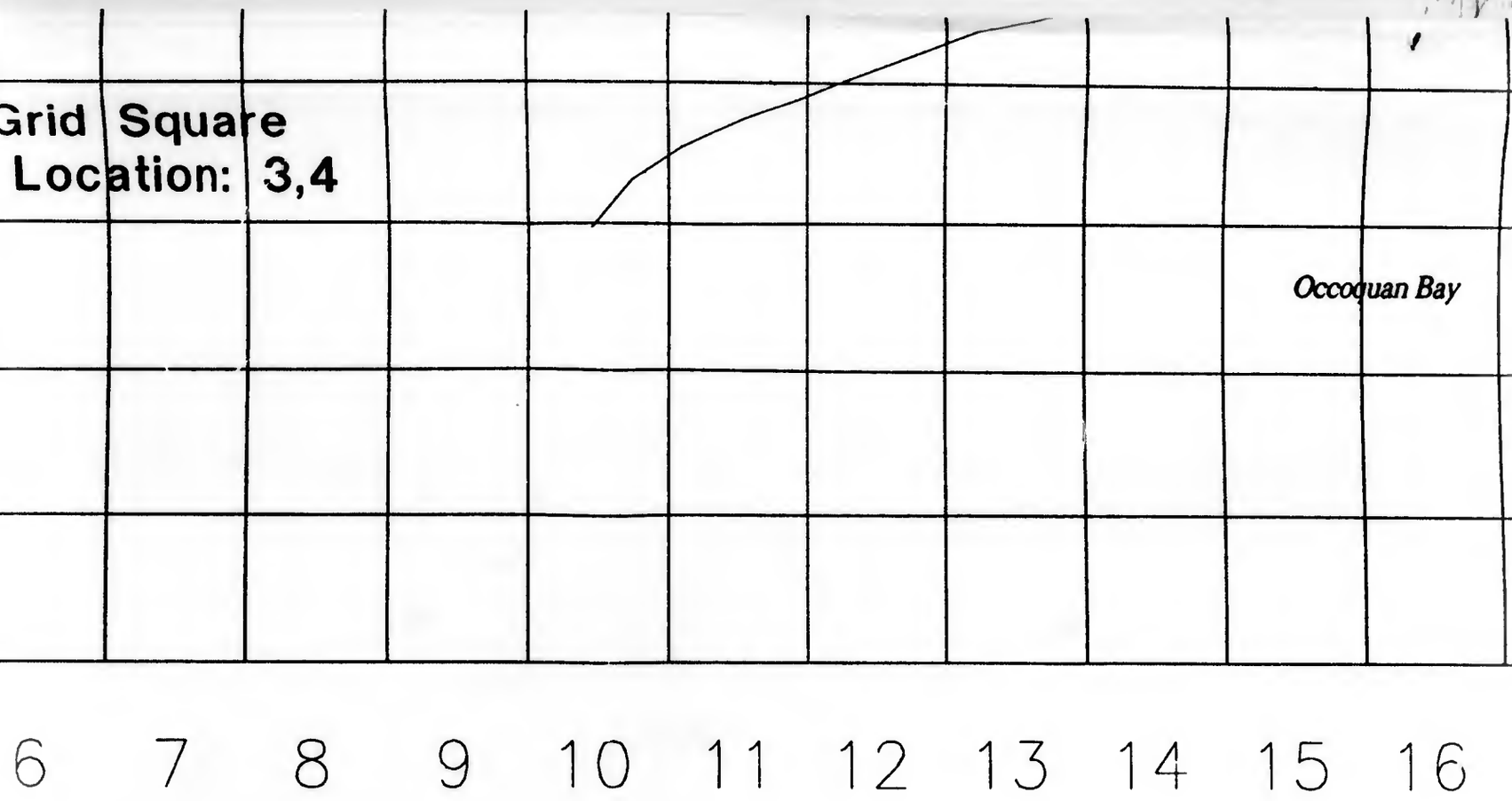
22 23 24 25 26 27 28 29 30 31 32

29 30 31 32 33 34 35 36 37



PARCEL LAB

14D-PS



PARCEL LABEL DEFINITIONS

D-PS

- A = ASBESTOS
- L = LEAD PAINT
- P = PCBs
- R = RADON
- X = UXO
- RD = RADIONUCLIDES
- PS = PETROLEUM STORAGE
- PR = PETROLEUM RELEASE/DISPOSAL
- HS = HAZARDOUS SUBSTANCES STORAGE
- HR = HAZARDOUS SUBSTANCES RELEASE/DISPOSAL
- (P) = PROBABLE QUALIFIER

- P = CERFA PARCEL
- Q = CERFA QUALIFIED PARCEL
- D = CERFA DISQUALIFIED PARCEL
- E = CERFA EXCLUDED PARCEL

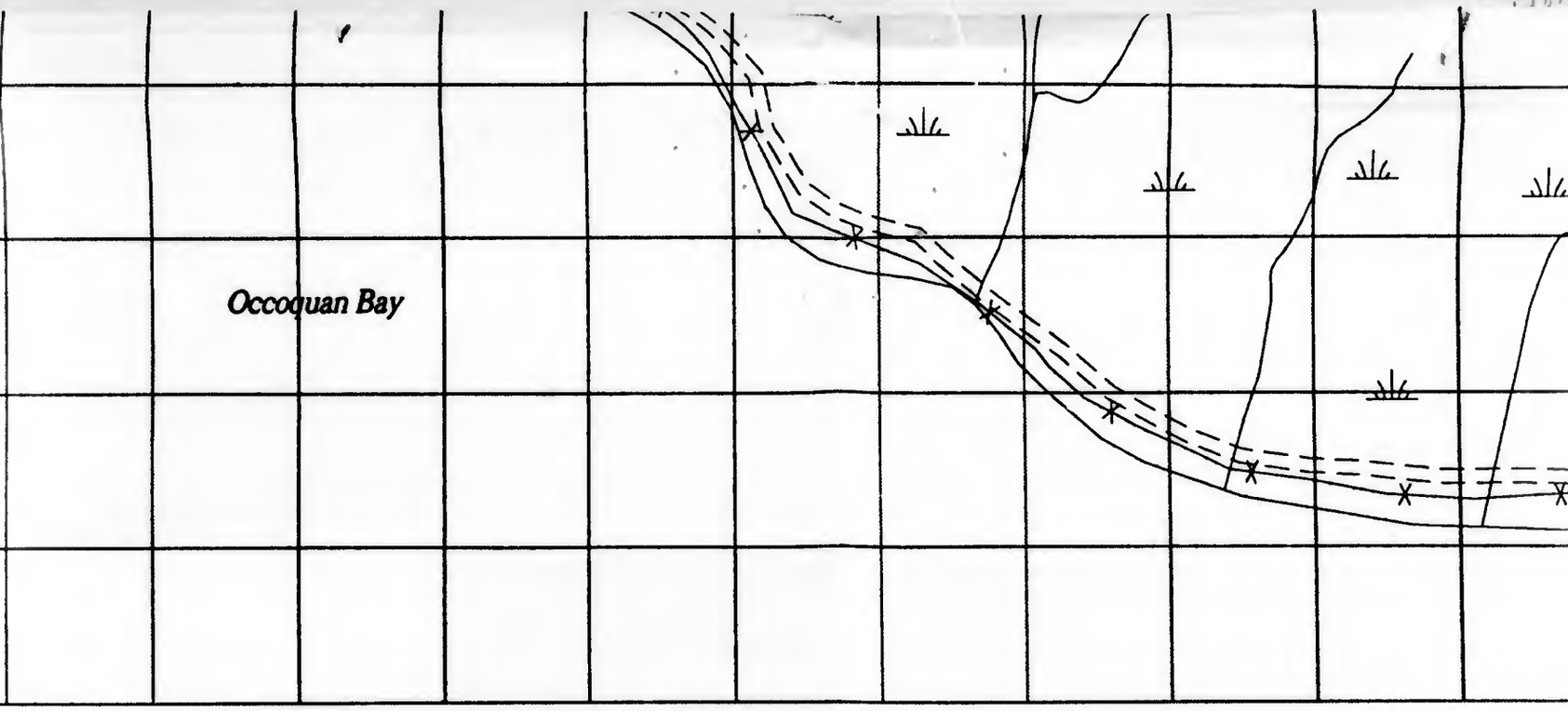
PARCEL NUMBER

Dis

CE

The are no
parcels at t

Compiled fr
by the U.S



14 15 16 17 18 19 20 21 22 23 24

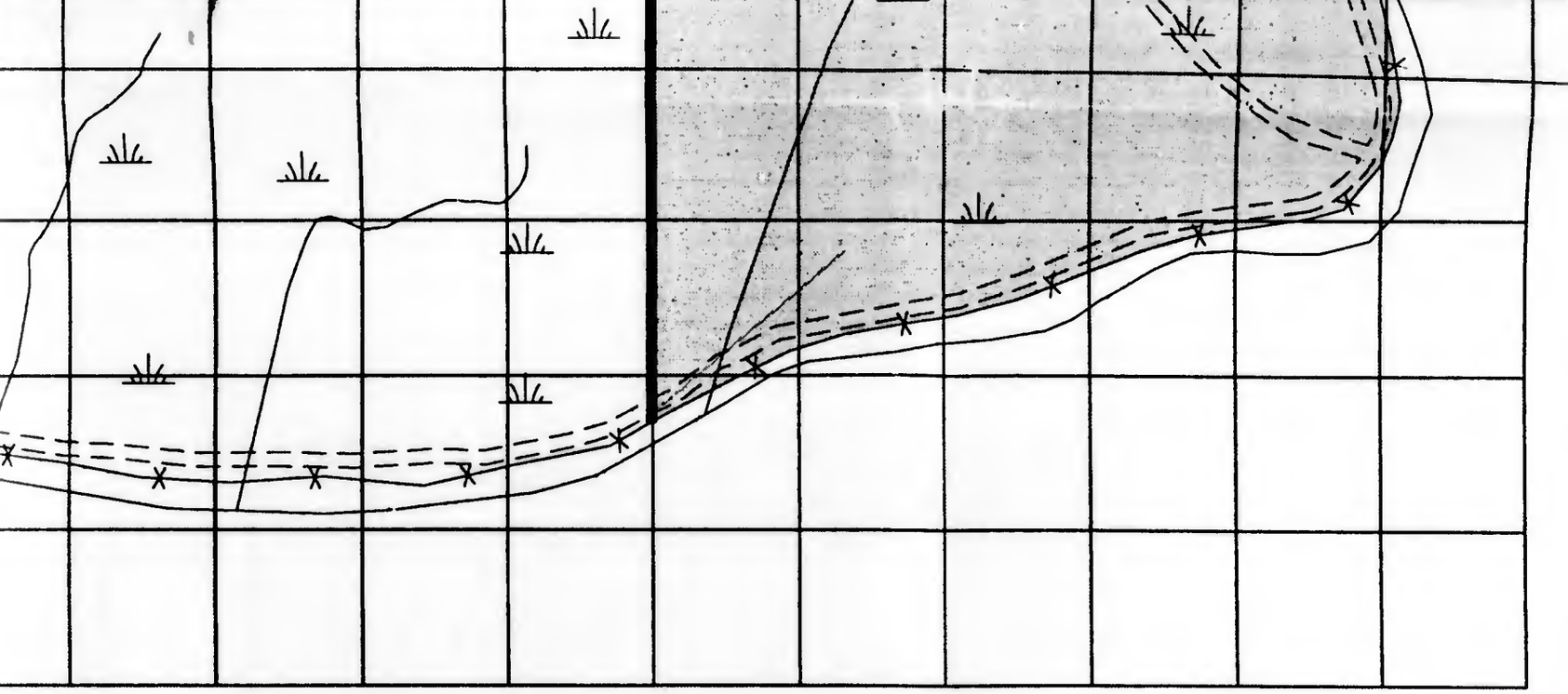
Disqualified Parcel

CERFA Parcel

The are no CERFA Qualified or Excluded parcels at this installation.

Compiled from various sources provided by the U.S. Army Environmental Center

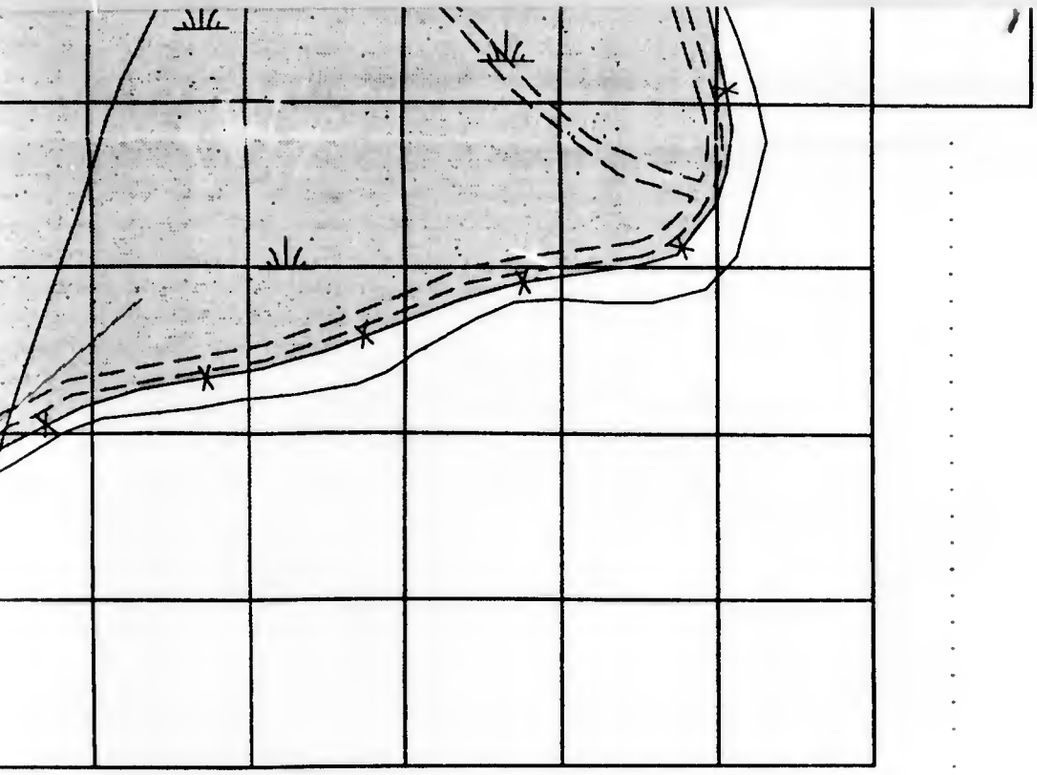
LEG



22 23 24 25 26 27 28 29 30 31 32

LEGEND

- Installation Boundary
- Hydrography
- Paved Road
- Unpaved Road
- Fence
- Structure
- Spill Areas
- Landfills (LF-6A)
- Probable Landfills (LF-6A)
- Unde
- Previ / Unde
- (T) Tran / With
- (A) Asbe
- A Prob



27 28 29 30 31 32 33 34 35 36 37

nstallation Boundary
lydrography
aved Road
Inpaved Road
ence
tructure

pill Areas

andfills

Probable Landfills

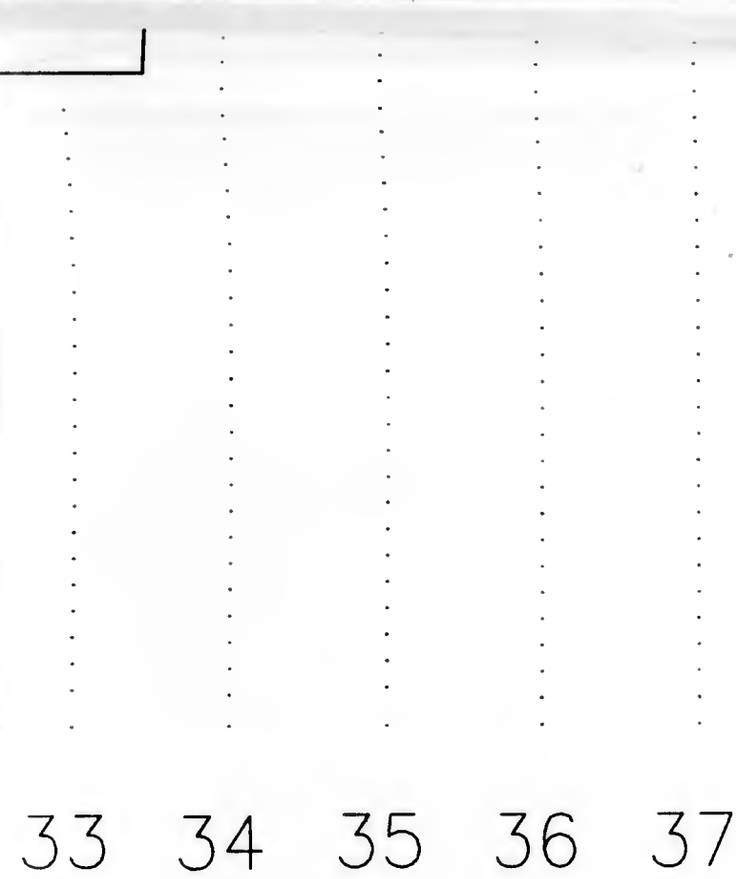
Underground Storage Tank

Previously Removed
Underground Storage Tank

Transformer Location
With PCBs

Asbestos

Probable Asbestos



33 34 35 36 37

derground Storage Tank

viously Removed
derground Storage Tank

ansformer Location
h PCBs

bestos

obable Asbestos

SCALE

0

FIGURE 5-

Woodbridge Resea

Woodbridge, Vi

Prepared For:	Scale:
USAEC	
Drawing No: 67070-006	Date:

Arthur D L

Cambridge, Massa

36 37

nk

nk

SCALE

0 1000 FT

FIGURE 5-3
Woodbridge Research Facility
Woodbridge, Virginia

Prepared For:	Scale:
USAEC	AS SHOWN
Drawing No:	Date:
67070-006	APR. 1994

Arthur D Little
Cambridge, Massachusetts

6.0 References

Environmental Monitoring Systems Laboratory - USEPA Region III. 1991. *Installation Assessment Army Base Closure Program: Woodbridge Research Facility, Woodbridge, Virginia.* Prepared for USATHAMA (includes aerial photographs).

Environmental Science and Engineering, 1981. *Installation Assessment of ERADCOM Activities: Harry Diamond Laboratories, Maryland; Woodbridge Research Facility, Virginia; Report No. 309A.* Prepared for the U.S. Army Toxic and Hazardous Materials Agency.

Roy F. Weston, 1992. *Enhanced Preliminary Assessment: Woodbridge Research Facility, Virginia.* Prepared for the U.S. Army Toxic and Hazardous Materials Agency.

The Earth Technology Corporation, 1993. *Draft Final Work Plan: Woodbridge Research Facility, Virginia.* Prepared for the U.S. Army Environmental Center.

The Earth Technology Corporation, 1993. *Preliminary Site Inspection Report.* (Draft Copy). Prepared for the U.S. Army Environmental Center. (Note: this document has not been released yet and the title is subject to change).

Virginia Department of Environmental Quality. May 11, 1993. Federal Facilities Program, Quarterly Report: *Site Visit Report: Woodbridge Research Facility.*

Woodbridge Research Facility, 1991. *Natural Resource Management Plan.* Compilation of documents by Woodbridge Research Facility personnel.

Appendix A: Federal Facilities Program - Quarterly Report

Appendix A

Federal Facilities Program - Quarterly Report

May 11, 1993

Site Visit Report
Woodbridge Research Facility (Army Research Laboratory)
May 11, 1993

On May 11, 1993, Lisa Ellis of the DEQ Waste Division Superfund Federal Facilities Program, visited Woodbridge Research Facility, along with Eileen Rowan and Dave Grimes of the DEQ Water Division's Office of Environmental Research and Standards. They met with Robert Craig of the Army Research Laboratory. The purpose of the visit was to conduct soil and sediment sampling in conjunction with the extra sampling being performed at all installations in the Chesapeake Bay watershed. A site visit was also conducted by Lisa Ellis prior to the sampling activity. The following AREEs (Areas requiring environmental evaluation) were toured and observations made.

AREE 1 - Landfill No. 1
Landfill No. 1 is a 0.4-acre site that was used as a dumping site for construction debris until 1973. Scrap metal was visible on the surface, and concrete could be seen in an eroding bank during the site visit. Materials that have been identified at the landfill include concrete, scrap metal, asphalt pavement, copper and steel wire, ceramic insulators, and piping wrapped with insulation. Some of the insulation appears to be old pipe lagging, which commonly contains asbestos. No detectable amounts of PCBs have been found in samples from six monitoring wells that were installed in 1985 to monitor PCBs. In 1973, a trench approximately 60 feet long was bulldozed in order to bury wooden boxes along the slope. The reason for this was, at least partly, to provide shore erosion control. Additionally, some capacitors may have been dumped at the site prior to closure. Practice firing of small arms into the landfill embankment occurred during the 1950s and 1960s. Soil and sediment sampling were performed in the vicinity of this landfill.

AREE 2 - Landfill No. 2
This landfill was used as a dumping site for transformers and capacitors in 1970 and 1971. PCB contamination was found in 1984, and in 1985 the landfill was excavated of six transformers and 85 capacitors. Groundwater samples from six monitoring wells have shown increases in PCB contamination annually until last sampled in 1990, but were said to be below the MCL for potential drinking water. Soil and sediment sampling were performed in the vicinity of this landfill.

AREE 3 - Landfill No. 3
Landfill No. 3 is approximately 100 feet by 25 feet by 10 feet deep and was used in the late 1960s and early 1970s. It is reported that wood debris and wire coated with lead, paper, and plastic were dumped before the site was covered with soil in 1973.

AREE 4 - Landfill No. 4
Numerous pieces of metal debris, wire, and concrete were seen on the surface during the site visit. The surface of an embankment was eroded and poorly vegetated. The site operated as a dump site from the late 1950s until 1973, at which time it was closed and covered. Materials in this landfill reportedly include wire, wood, concrete, metal, pipe insulation, and empty oil drums. Soil and sediment sampling was performed in the vicinity of this landfill.

AREE 5 - Landfill No. 5
This landfill operated during the 1950s and 1960s and was closed before 1970. It contains an approximately 5-foot-high earthen mound covered with vegetation. Metal debris is visible sticking out of the soil. Ground scars and excavations with debris were noted in 1966 and 1975.

AREE 7 - Pistol Range
Facility personnel reportedly used an embankment north of Landfill No. 1 as a pistol range for qualification of small arms firing on a semi-annual basis during the 1970s. This occurred until the firing range was covered with backfill material and firing practice was stopped as a regular activity at WRF.

AREE 8 - UST Leaks and Spills
Two 10,000-gallon no. 2 heating oil tanks were removed from this area in June 1990 after failing leak tests. An adjacent 10,000-gallon tank had been removed in 1981 after a leak was observed. It was replaced with a 2,000-gallon fiberglass UST. Several oil spills were reported in the area around the three former USTs. Soil samples analyzed for TPH were found to contain less than 25 mg/kg.

AREE 10 - Maintenance Shop
Activities performed at Building 202 include small equipment maintenance, carpentry, and minor electrical repairs. Materials stored in the building include motor oil, solvents, brake fluid, battery acid, paint, and thinner. The motor pool is in the center of the building. Carpentry supplies and paints are stored in rooms on the west, and the room to the east contains electrical switching and circuit breaker equipment. The motor pool contains a parts cleaner and several drums of motor oil, antifreeze, and brake fluid. Vehicle maintenance no longer takes place within the shop. The waste materials noted stored in drums outside the building during the previous site visit were in the process of being removed during this site visit.

AREE 11 - Oil/Water Separator
The oil/water separator near Building 202 is an approximately 1,000-gallon concrete tank. It

receives from the paved area north of Building 202 and from a wash rack in the same area (during the site visit, the only possible drain on the paved area was a water filled depression in the pavement that was not draining water). It discharges to a grassy area outside the fenced compound. The wash rack was plugged about 6 years ago when washing of vehicles on-site was prohibited. During the site visit, a sludge sample was taken from the pit outside the maintenance shop to analyze for PCBs. The contents of the tank had previously been pumped.

AREE 12 - Drum Storage Area
The paved area north of Building 202 had been used in the past for storing drums of waste liquids such as motor oil, antifreeze, brake fluid, and cleaning solvent. All drums had been removed since the previous site visit.

AREE 13 - Acid Neutralization Tank
This tank was constructed adjacent to a battery room during the construction of Building 211 to contain any spills in the battery room. The battery room is used for storage and charging of small lead/acid batteries similar to automotive batteries. The tank is approximately 1,000-gallon concrete underground tank. There have been no significant spills reported in the battery room.

AREE 14 - Oil/Water Separator
The oil/water separator north of Building 211 is an approximately 1,000-gallon concrete tank. Its purpose is to collect spills in the building. It discharges to the grassy area to the east of the fenced compound. There have been no spills reported in Building 211, and no significant amounts of hazardous liquids are believed to have been handled there.

AREE 15 - Transformers
There are eight transformers at WRF. Seven were tested to have less than 10 ppm PCBs, but one contained 565,800 ppm PCBs. It was determined to be Aroclor 1260 in Pyranol oil. This PCB transformer was located outside at the northeast corner of Building 201 on a fenced concrete pad. Attached to this transformer was an electrical switch containing 65 gallons of pyranol, which was said to consist of 50 to 60% PCB. The concrete pad was uncurbed but showed no indication of leaking.

AREE 18 - Flammable/Battery Storage
A small two-room concrete structure (Building 204) is used to store flammable materials and vehicle batteries. The western room is a flammables storage room and currently contains two empty 55-gallon drums and one 55-gallon drum partially filled with mineral oil. The eastern room contains vehicle batteries. Both rooms have a concrete floor, but only the battery room has a drain. It is unknown where the drain discharges.

AREE 19 - Thermal Battery Storage
Thermal Batteries were stored in two metal transport containers in a grassy area next to the flammable storage building. These batteries were used to activate fuse components in particular Army missiles and mortars. The active components of the batteries were sealed in metal cans and were not believed to be leaking. The batteries contained an electrolyte of lithium chloride and potassium chloride, a cathode of calcium chromate or potassium chromate, and an anode of solid calcium. The batteries also contained a pyrotechnic heat source consisting of powdered zirconium and an ignition source such as a heated wire or a percussion primer. The batteries were also insulated with asbestos. There were a total of over 13,000 batteries that weigh about 8,800 pounds. It is unlikely there were any releases.

AREE 20 - Former Incinerator
A small incinerator was used for burning classified documents from the 1950s until 1970. It was removed in 1972. It was a metal box approximately 8 feet by 5 feet by 6 feet high. The ash was shoveled into drums and was disposed of in Landfill No. 1.

AREE 21 - Former Storage Area
An area to the east of Building 211 was used as a storage yard before the building was built. Aerial photos from 1962 to 1975 indicated vehicles or metal storage boxes. Reportedly, the transformers disposed of in Landfill No. 2 were stored at this site prior to disposal. According to the photos, the area was paved at the time, but it is unknown if the transformers were stored on the pavement or the surrounding grassy soil.

AREE 22 - Drainage Ditch
The drainage ditch runs to the north and east of the fenced compound and may have received contaminated runoff from the wash rack and oil/water separators and the various oil spills (AREEs 8 and 17). Aerial photos from the 1960s indicate possible stains and wet soil near the drainage ditch.

AREE 23 - Former Underground Storage Tanks
WRF is conducting a program of leak testing USTs and removing those tanks that fail. Six tanks have been removed. The last tank removed was a 1,000-gallon fuel oil tank near Building 101. TPH was determined to be 230 ppm in soil adjacent to the excavated tank and 10 cubic yards of soil are scheduled to be excavated. Three 10,000-gallon USTs were removed from near Building 202 (AREE 8). A 1,000-gallon steel gasoline UST located near Building 202 was removed in 1990. TPH was only 25 mg/kg. This tank was replaced by a new 1,000-gallon fiberglass tank. A 2,000-gallon steel heating oil UST was removed from the ground near Building 203 in 1986 or 1987.

AREE 24 - Existing Underground Storage Tanks

There are six existing USTs. Two have been leak-tested and passed. The remaining tanks will have been leak-tested within the last year or will be in the next year. The existing tanks include one new fiberglass tank, one fiberglass tank installed in 1981, and four steel tanks installed between 1966 and 1976. The new tank, a 1,000-gallon tank for gasoline, is double-wall fiberglass with fiberglass piping. The other fiberglass tank is of unknown construction and has coated steel piping. The steel tanks are either painted or asphalt-coated, with coated steel piping.

AREE 26 - Buried Antifreeze in Hoses

Antifreeze, which consisted mainly of ethylene glycol, was put in neoprene rubber hoses 3/4 to 2 inches in diameter, which were cut to length, plugged at one end, filled with fluid, and sealed at the other end. The tubes were then buried at a depth 1 to 3 feet. They were placed 6 to 20 feet apart in a random pattern over a square area approximately 2,000 feet on a side. The hose is uncovered periodically. When it is uncovered, it generally still contains the antifreeze, which usually leaks onto the ground during excavation. Most of the hoses are still in the ground.

AREE 27 - Buried Wire

Electrical cable was buried throughout the facility as part of an antenna for a worldwide communication system in the early 1950s and used until 1970. There have been subsequent tests which have used buried cable to a lesser extent. The cable consists of a copper wire surrounded by a metal shield that contains copper, aluminum, or stainless steel, which is encased in a plastic outer coating. A limited amount of cable may have had a shield containing lead. Some of the cable has been dug up during excavations, but most remains in the ground. Pieces of the cable are visible on the surface throughout the facility. It is possible that some of the buried cable could contain PCB-impregnated insulation material.

Appendix B

Federal Database Search

DATABASE UPDATE DATES & MAP STATUS EXPLANATIONS

Databases	Date Of Agency Update
NPL/Superfund Sites	04/03/93
EPA CERCLIS Sites	04/03/93
SARA III Facilities	12/31/92
ERNS Hazardous Material Spills	08/15/92
RCRA Corrective Action	03/01/93
RCRA D Landfills	03/01/93
RCRA Facilities (All Categories)	09/01/92
FINDS Facilities	10/30/92
State Landfills	01/14/93
Leaking UST's	06/30/93
Registered UST's	11/24/92

Map Status Explanations

IN SEARCH AREA - SITE MAPPED:
This represents a site which was mapped upon your request.

LOCATION UNKNOWN - SITE NOT MAPPED:
This represents a site which we were unable to exclude from your search area because of insufficient address/location information. We are including this report for your reference in case it might be in your area of investigation.

ADVISORY ONLY - SITE NOT MAPPED:
This represents a site address which was found to be outside your search area, but which may encroach on your project area. We have included these reports for your reference.

DATABASE REFERENCE SHEET

EPA INFORMATION SYSTEMS

NPL/Superfund Sites: National Priority Listing Sites - those sites that pose an immediate public health hazard and immediate (cleanup) response is necessary. EPA (Environmental Protection Agency) database. Also found in CERCLA.

NPL/Superfund Potentially Responsible Parties: Potentially Responsible Parties (PRP's) are individuals, businesses, municipalities, and other entities that been identified by the EPA has being potentially liable to held fund (or repay) environmental cleanup costs. EPA database.

Civil Enforcement Docket: EPA information system used to track civil judicial cases against PRP's and other entities.

CERCLA Sites: EPA database that tracks the sites found on the CERCLIS data system (Comprehensive Environmental Response, Compensation and Liability Information System). These usually abandoned/inactive hazardous waste sites are under review to determine the extent of the public health hazard.

SARA III TRIS Facilities: Also known as SARA Title 3 Facilities. SARA = Superfund Amendments and Reauthorization Act. Also referenced as Emergency Planning and Community Right-To-Know Act Section 313 Form R reporting. These facilities have at least 10 full-time employees, and either use, manufacture, import, and/or process any one of the toxic chemicals referenced in 40 CFR 372 Subpart D. EPA database.

Hazardous Material Spills: The EPA maintains the Emergency Response Notification System (ERNS) that is the information repository housing information on Hazardous Spills nationwide. This information repository is based on reports filed by local agencies such as fire & police; County agencies; State entities; and Federal agencies such as the Coast Guard and the National Response Center and the EPA as well.

RCRA Corrective Action: These facilities permitted under RCRA (Resource Conservation and Recovery Act) to handle hazardous waste have been found to have waste handling problems. The facilities are undergoing Corrective Action Activities to correct the problems and resume normal operations. EPA database.

RCRA D Landfills: These are landfills that have accepted hazardous waste during their operation. These landfills can be currently operating or closed. The majority of sites in this system are inactive. EPA database.

RCRA Notifier Facilities: The source of this data comes from the EPA RCRIS (Resource Conservation and Recovery Information System) computer system. These facilities have been permitted to handle hazardous waste as defined in the Resource Conservation and Recovery Act (RCRA).

The facility types found in RCRIS are -
Large Quantity Generators: generate more than 1000 kg hazardous waste/month, or > 1 kg acutely hazardous waste/calendar month. Or

generate 1 kg or less and/or accumulate more than 1 kg of residue, soil, etc. from acutely hazardous waste per calendar month

Small Quantity Generators: generate more than 100 and less than 1000 kg of hazardous waste during any calendar month & accumulate less than 6000 kg of hazardous waste at any time or generate 100 kg or less of hazardous waste during any calendar month, and accumulate more than 1000 kg of hazardous waste at any time.

Conditionally Exempt: generate 100 kg or less of hazardous waste during any calendar month, and accumulate less than 1000 kg of hazardous waste at any time or generate 1 kg or less of acutely hazardous waste per calendar month and accumulate at any time generate or accumulate 100 kg or less of contaminated residue

Transporter: facility engaged in the transportation of hazardous waste.

Treatment/Storage/Disposal (TSD) Facility: facility is engaged in the treatment, storage, or disposal of hazardous waste.

FINDS Facilities: The EPA Facility Index System (FINDS) references any facility or event that has ever received an EPA ID number. The EPA program office that issued the ID number is also listed.

Permitted CLEAN AIR Facilities: EPA information system that contains the permit, compliance, and emissions inventory for facilities requiring a permit under the Clean Air Act.

NPDES Plants (PCS): This EPA database lists the facilities permitted in the National Pollution Discharge Elimination System. The Permit Compliance System (PCS) warehouses the data made available. Facilities found in this database are those that discharge to a surface water system from a point (identifiable) source.

STATE INFORMATION SYSTEMS

State Superfund/Cleanup Sites: Each State has the right to assemble and maintain a list of State designated - hazardous waste cleanup sites. Some States use the EPA CERCLIS as their reporting system, other States have a unique database independent of the EPA sites.

Landfills/Solid Waste Disposal Sites: This list tracks the active & closed landfill and waste disposal sites reported by each state agency.

Leaking Underground Storage Tanks (LUST): This State list tracks all reported Leaks and releases from Underground Storage Tanks. The majority of these incidents involve petroleum dispensing facilities.

Registered Underground Storage Tanks (RUST): The State information system tracks the known and permitted registered underground storage tanks. The majority of these sites involve petroleum dispensing facilities. Some states are also including Aboveground Tanks.

MAP LEGEND

ENVIRONMENTAL SITE SYMBOLS

SITE FOR ENVIRONMENTAL DATA-SEARCH

NPL/SUPERFUND SITE

CERCLA SITE

SARA III/TRIS SITE
(TOXIC RELEASE INVENTORY FACILITY)

ERNS SITE
(REPORTED HAZARDOUS MATERIAL SPILL)

RCRA CORRECTIVE ACTION SITE

RCRA NOTIFIER FACILITY

LANDFILL OR RCRA SUBTITLE D
WASTE LANDFILL

FINDS FACILITY

AIR FACILITY

AIR MONITORING STATION

PCS FACILITY

STATE SUPERFUND SITE

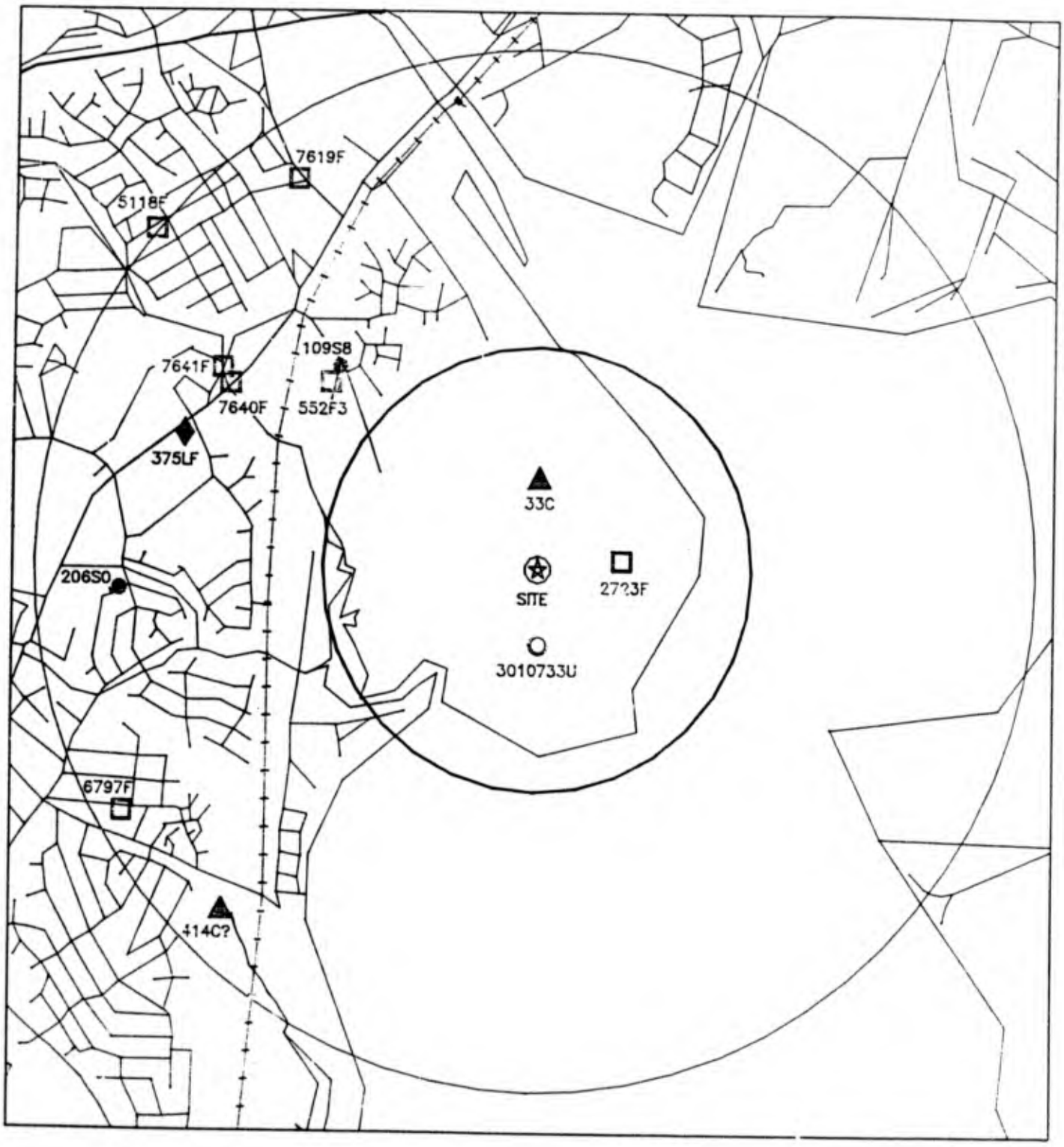
REPORTED LEAKING
UNDERGROUND STORAGE TANK

REGISTERED
UNDERGROUND STORAGE TANK

STATE CERCLIS/CORTESE SITE

CULTURAL FEATURES

Woodbridge Research Fac. - Woodbridge, VA
Scale: 1"=2500' - Search Area Map



Woodbridge Research Fac. -- Woodbridge, VA
Scale:1"=2500' -- CERCLA, ERNS, FINDS, RUST, DUMPS

CERCLA SITE REPORT

Map Status: ADVISORY ONLY - SITE NOT MAPPED (DISREGARD MAP #)

Map Number: 500C EPA Region: 03

EPA ID Number: VAD988189338

Site Name: I-95 LANDFILL (LORTON)
Address: 9850 FERNECE ROAD
City: LORTON
County: FAIRFAX
State: VA Zip Code: 22079

USGS Hydrological Unit: 02070010

Date Of Last EPA Update For Site: 11/03/92

Federal Facility Flag: IS NOT A FEDERAL FACILITY
SITE IS NOT ON THE DOCKET

Ownership Indicator: COUNTY OWNED
Site Incident Category: UNKNOWN - NOT GIVEN
Site Classification: NO DETERMINATION

Site Description: MUNICIPAL LANDFILL (1ST PERMITTED IN APRIL 1973). SOME LEACHATE CARRIED OFF SITE BY A CULVERT IN THE LANDFILL. LEACHATE MONITORED SINCE FEB. 1989. GROUND WATER MONITORING TO BEGIN BY JULY 1991.

NPL Status: THE SITE IS NOT AND NEVER HAS BEEN ON THE PROPOSED AND/OR FINAL NPL

Further Action Flag: NO FURTHER REMEDIAL ACTION PLANNED

CERCLIS Status:
RCRA Flag: UNKNOWN - NOT GIVEN

========== EPA Events That Have Taken Place At The Site ==========

EVENT	LEAD	DATE
DISCOVERY	EPA FUND-FINANCED	01/03/91
PRELIMINARY ASSESSMENT	STATE, FUND FINANCED	03/11/92

CERCLA SITE REPORT

Map Status: IN SEARCH AREA - SITE MAPPED (REFER TO MAP #)

Map Number: 33C EPA Region: 03

EPA ID Number: VA7210020981

Site Name: USA WOODBRIDGE RESEARCH FACILITY
Address: DAWSON BEACH ROAD
City: WOODBRIDGE
County: PRINCE WILLIAM
State: VA Zip Code: 22191

USGS Hydrological Unit: 02070010

Date Of Last EPA Update For Site: 11/03/92

Federal Facility Flag: FEDERAL FACILITY
SITE IS NOT ON THE DOCKET

Ownership Indicator: FEDERALLY OWNED
Site Incident Category: UNKNOWN - NOT GIVEN
Site Classification: NO DETERMINATION

Site Description:

NPL Status: THE SITE IS NOT AND NEVER HAS BEEN ON THE PROPOSED AND/OR FINAL NPL

Further Action Flag:

CERCLIS Status:
RCRA Flag: UNKNOWN - NOT GIVEN

========== EPA Events That Have Taken Place At The Site ==========

EVENT	LEAD	DATE
DISCOVERY	EPA FUND-FINANCED	01/01/84
PRELIMINARY ASSESSMENT	FEDERAL FACILITIES	02/01/85

CERCLA SITE REPORT

Map Status: IN SEARCH AREA - SITE MAPPED (REFER TO MAP #)

Map Number: 414C EPA Region: 03

EPA ID Number: VAD981109986

Site Name: UNITED FIBER GLASS INC
Address: FEATHERSTONE INDUSTRIAL PARK
City: WOODBRIDGE
County: PRINCE WILLIAM
State: VA Zip Code: 22191

USGS Hydrological Unit: 02070010

Date Of Last EPA Update For Site: 11/03/92

Federal Facility Flag: IS NOT A FEDERAL FACILITY
SITE IS NOT ON THE DOCKET

Ownership Indicator: OTHER
Site Incident Category: UNKNOWN - NOT GIVEN
Site Classification: NO DETERMINATION

Site Description: CLOSED FIBERGLASS MANUFACTURING SITE

NPL Status: THE SITE IS NOT AND NEVER HAS BEEN ON THE PROPOSED AND/OR FINAL NPL

Further Action Flag: NO FURTHER REMEDIAL ACTION PLANNED

CERCLIS Status:
RCRA Flag: UNKNOWN - NOT GIVEN

========== EPA Events That Have Taken Place At The Site ==========

EVENT	LEAD	DATE
DISCOVERY	EPA FUND-FINANCED	02/18/86
PRELIMINARY ASSESSMENT	STATE, FUND FINANCED	12/31/86
SCREENING SITE INSPECTION	STATE, FUND FINANCED	08/12/88

HAZARDOUS MATERIAL SPILL REPORT

Map Status: IN SEARCH AREA - SITE MAPPED (REFER TO MAP #)

Map Number: 109S8

Report Number: 04323
Date Spill Was Reported: 04/05 1988
Date Of Spill: 04/05 1988

Spill Location:

City: WOODBRIDGE

Zip Code:

County: PRINCE WILLIAM

Material And Amount Spilled

LIME SLURRY UNKNOWN Amount

Environments Possibly Effected By The Spill:
LAND

Agencies Notified Of Spill:

Action Taken:

Description: DUMPING INTO PIT FOR STORAGE UNTIL BEING PICKED

Comments:

Potentially Responsible Party Information

PRP:
DABNEY RD
WOODBRIDGE
VA 221910000

Telephone:

HAZARDOUS MATERIAL SPILL REPORT

Map Status: IN SEARCH AREA - SITE MAPPED (REFER TO MAP #)

Map Number: 206S0

Report Number: VA90146
Date Spill Was Reported: 03/07 1990
Date Of Spill: 03/06 1990

Spill Location:
14202 RANDALL DRIVE

City: WOODBRIDGE

Zip Code: 22152-

County: PRINCE WILLIAM

Material And Amount Spilled

UNKNOWN OIL UNKNOWN Amount

Environments Possibly Effected By The Spill:
UNKNOWN

Agencies Notified Of Spill:

Action Taken:

Description: PRIVATE RESIDENCE

Comments: * PROPERTY. REPORTER STATES HIS PROPERTY IS SATURATED WITH OIL.

Potentially Responsible Party Information

PRP: UNKNOWN OCCUPANT
14202 RANDALL DRIVE
WOODBRIDGE
VA 22152-

Telephone:

HAZARDOUS MATERIAL SPILL REPORT

Map Status: LOCATION UNKNOWN - SITE NOT MAPPED (DISREGARD MAP #)

Map Number: 61S7

Report Number: 01999
Date Spill Was Reported: 02/20 1987
Date Of Spill: 02/20 1987

Spill Location:
ON OCCOQUAN, COMING FROM UP STREAM, SIGHTED WHILE GOING OVER RT1 BRID

City: WOODBRIDGE Zip Code:

County: PRINCE WILLIAM

Material And Amount Spilled

UNKNOWN OIL UNKNOWN Amount

Environments Possibly Effected By The Spill:
OCCOQUAN RIVER

Agencies Notified Of Spill:

Action Taken:

Description: UNKNOWN, POSSIBLY COMING FROM MARINA

Comments:

Potentially Responsible Party Information

PRP:

Telephone:

HAZARDOUS MATERIAL SPILL REPORT

Map Status: LOCATION UNKNOWN - SITE NOT MAPPED (DISREGARD MAP #)

Map Number: 762S9

Report Number: 22657
Date Spill Was Reported: 12/19 1989
Date Of Spill: 12/19 1989

Spill Location:

City: WOODBRIDGE Zip Code:

County: PRINCE WILLIAM

Material And Amount Spilled

GASOLINE 00004500.00 Gallons

Environments Possibly Effected By The Spill:
UNNAMED STREAM>OCCOQUAN RIVER

Agencies Notified Of Spill: WATER CONTROL BOARD

Action Taken:

Description:

Comments:

Potentially Responsible Party Information

PRP: WOODBRIDGE MOBIL STATION

Telephone:

FINDS FACILITY REPORT

Map Status: ADVISORY ONLY - SITE NOT MAPPED (DISREGARD MAP #)

Map Number: 4834F EPA ID Number: VAD101050938

Facility: WOODBRIDGE PRIMARY DAY SCHOOL
Address: 1420 G STREET
City: WOODBRIDGE State: VA Zip Code: 22191

Date Of Last EPA Update: 910328

Standard Industrial Classification For Facility: 8211

EPA PROGRAM OFFICE LISTING FOR FACILITY	ID NUMBER
ENFORCEMENT & COMPLIANCE MONITORING	03-89-0490

Map Status: IN SEARCH AREA - SITE MAPPED (REFER TO MAP #)

Map Number: 2723F EPA ID Number: VA7213820981

Facility: HARRY DIAMOND LAB WOODBRI
Address: DAWSON BEACH ROAD
City: WOODBRIDGE State: VA Zip Code: 23319

Date Of Last EPA Update: 910128

EPA PROGRAM OFFICE LISTING FOR FACILITY	ID NUMBER
FEDERAL ACTIVITIES	VA-213820981

FINDS FACILITY REPORT

Map Status: IN SEARCH AREA - SITE MAPPED (REFER TO MAP #)

Map Number: 5118F EPA ID Number: VAD162824809

Facility: PETER PAN DAY NURSERY
Address: 1431 F STREET
City: WOODBRIDGE State: VA Zip Code: 22191

Date Of Last EPA Update: 910328

Standard Industrial Classification For Facility: 8351

EPA PROGRAM OFFICE LISTING FOR FACILITY	ID NUMBER
ENFORCEMENT & COMPLIANCE MONITORING	03-89-0399

Map Status: IN SEARCH AREA - SITE MAPPED (REFER TO MAP #)

Map Number: 552F3 EPA ID Number: VAD988207064

Facility: POTOMAC AIRGAS INC
Address: 13740 DABNEY RD
City: WOODBRIDGE State: VA Zip Code: 2219114[illegible]

Date Of Last EPA Update: 911025

Standard Industrial Classification For Facility: 5169 5084

EPA PROGRAM OFFICE LISTING FOR FACILITY	ID NUMBER
TOXIC SUBSTANCES	22191PTMCR13740

FINDS FACILITY REPORT

Map Status: IN SEARCH AREA - SITE MAPPED (REFER TO MAP #)

Map Number: 6797F EPA ID Number: VAD988168977

Facility: TLC EARLY LEARNING CENTER
Address: 1511 WALNUT ST
City: WOODBRIDGE State: VA Zip Code: 22191

Date Of Last EPA Update: 890411

EPA PROGRAM OFFICE LISTING FOR FACILITY	ID NUMBER
ENFORCEMENT & COMPLIANCE MONITORING	03-89-0463

Map Status: IN SEARCH AREA - SITE MAPPED (REFER TO MAP #)

Map Number: 7619F EPA ID Number: VAD988181152

Facility: DUNIVIN EXXON
Address: 13306 GORDON BLVD.
City: WOODBRIDGE State: VA Zip Code: 000000000

Date Of Last EPA Update: 901003

EPA PROGRAM OFFICE LISTING FOR FACILITY	ID NUMBER
AIR & RADIATION	5115300074

FINDS FACILITY REPORT

Map Status: IN SEARCH AREA - SITE MAPPED (REFER TO MAP #)

Map Number: 7640F EPA ID Number: VAD988181368

Facility: GOLDEN RULE PRESS IN
Address: 13724 JEFFERSON DAVI
City: WOODBRIDGE State: VA Zip Code: 22191

Date Of Last EPA Update: 901003

EPA PROGRAM OFFICE LISTING FOR FACILITY	ID NUMBER
AIR & RADIATION	5115348410

Map Status: IN SEARCH AREA - SITE MAPPED (REFER TO MAP #)

Map Number: 7641F EPA ID Number: VAD988181376

Facility: SPRAY KLEEN CO INC
Address: 1242 EASY ST
City: WOODBRIAR State: VA Zip Code: 22191

Date Of Last EPA Update: 901003

EPA PROGRAM OFFICE LISTING FOR FACILITY	ID NUMBER
AIR & RADIATION	5115348538

FINDS FACILITY REPORT

Map Status: LOCATION UNKNOWN - SITE NOT MAPPED (DISREGARD MAP #)

Map Number: 1513F3 EPA ID Number: VAD988217287

Facility: VA CONCRETE CO
Address: RICHMOND HWY
City: WOODBRIDGE State: VA Zip Code: 22191

Date Of Last EPA Update: 920501

EPA PROGRAM OFFICE LISTING FOR FACILITY	ID NUMBER
AIR & RADIATION	5115300018

Map Status: LOCATION UNKNOWN - SITE NOT MAPPED (DISREGARD MAP #)

Map Number: 5250F EPA ID Number: VAD980257448

Facility: VIRGINIA CONCRETE
Address: RICHMOND HWY
City: WOODBRIDGE State: VA Zip Code: 22191

Date Of Last EPA Update: 910227

EPA PROGRAM OFFICE LISTING FOR FACILITY	ID NUMBER
UNKNOWN - NOT GIVEN	

FINDS FACILITY REPORT

Map Status: LOCATION UNKNOWN - SITE NOT MAPPED (DISREGARD MAP #)

Map Number: 5453F EPA ID Number: VAD980714125

Facility: OCCOQUAN - WOODBRIDGE FEATHERS
Address: FEATHERSTONE INDUSTRIAL RD
City: WOODBRIDGE State: VA Zip Code: 22191

Date Of Last EPA Update: 840517

Standard Industrial Classification For Facility: 4952

EPA PROGRAM OFFICE LISTING FOR FACILITY	ID NUMBER
WATER ENFORCEMENT & PERMITS	VA0025071

Map Status: LOCATION UNKNOWN - SITE NOT MAPPED (DISREGARD MAP #)

Map Number: 7224F EPA ID Number: VAD988176277

Facility: OGDEN MARTIN SYS.FAI
Address: RT 611(FURNACE RD)
City: LORTON State: VA Zip Code: 22079

Date Of Last EPA Update: 900926

EPA PROGRAM OFFICE LISTING FOR FACILITY	ID NUMBER
AIR & RADIATION	5105900560

VIRGINIA REGISTERED UNDERGROUND STORAGE TANK REPORT

Map Status: IN SEARCH AREA - SITE MAPPED (REFER TO MAP #)

Map Number: 3010733U

Facility ID: 3-010733
Facility Name: WOODBRIDGE RESEARCH FACILITY
Address: DAWSON BEACH DR.
City: WOODBRIDGE St: VA Zip: 22193
County: PRINCE WILLIAM

Manager: CONNER GIBSON JR.
Manager Phone: (202) 394-1060

Owner ID: 5224
Owner Name: HARRY DIAMOND LABORATORIES
Owner Phone: (202) 394-1060

Facility Type		Owner Type	
FEDERAL:	X	FEDERAL:	X
STATE:		STATE:	
LOCAL:		LOCAL:	
PRIVATE:		PRIVATE:	
COMMERCIAL:		COMMERCIAL:	

Number of Tanks: 10

STATE LANDFILL REPORT

Map Status: ADVISORY ONLY - SITE NOT MAPPED (DISREGARD MAP #)

Map Number: 055LF Permit Number: 055

Site: FAIRFAX-LORTON LF
Address: 3930 PENDER DR
City: FAIRFAX State: VA Zip: 22030

Status: CLOSED
Type: SANITARY LANDFILL
Ownership: GOVERNMENT

Contact Name: DIV SOLID WASTE
Phone: 703 246-5040

Map Status: ADVISORY ONLY - SITE NOT MAPPED (DISREGARD MAP #)

Map Number: 103LF Permit Number: 103

Site: I-95 LF
Address: 3930 PENDER DR
City: FAIRFAX State: VA Zip: 22030

Status: ACTIVE
Type: SANITARY LANDFILL
Ownership: GOVERNMENT

Contact Name: DIV SOLID WASTE
Phone: 703 246-5040

Map Status: IN SEARCH AREA - SITE MAPPED (REFER TO MAP #)

Map Number: 375LF Permit Number: 375

Site: HYLTON ENTERPRISES
Address: 13901 JEFF DAVIS HWY
City: WOODBRIDGE State: VA Zip: 22191

Status: CLOSED
Type: SANITARY LANDFILL
Ownership: PRIVATE

Contact Name: J WALVIUS
Phone: NOT GIVEN

Woodbridge Research Fac. – Woodbridge, VA
Scale:1"=2500' – RCRA Generators

(N)

Woodbridge Research Fac. – Woodbridge, VA
Scale:1"=2500' – Leaking Storage Tanks

LEAKING UNDERGROUND STORAGE TANK/STATE SPILL REPORT
VIRGINIA WATER CONTROL BOARD
POLLUTION REMEDIATION PROGRAM

Map Status: IN SEARCH AREA - SITE MAPPED (REFER TO MAP #)

Map Number: 891514L Fiscal Year: 89
Date: 5/11/89

Complaint Number: 1514
City/County: PRINCE WILLIAM CO.

Incident Description:

UMPERMITTED DISCHARGE OF WASH WATER AT 13800 DAWSON BEACH RD., DAWSON BEACH INDUSTRIAL PARK

Pollutant: MISCELLANEOUS
Amount Spilled - Gallons:
Amount To Water - Gallons:

Waterbody Possibly Effected: MARUMSCOE CR.

Cleaned Up By:
Clean Up Code:

Responsible Party: ARBAN CAROSI
Spiller/Discharger: ARBAN CAROSI
Report Status: COMPLETE REPORT NOT ON FILE
Cost-Recovery Letter:

Appendix B-2: State Database Search (April 1994)

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

Richard N. Burton
Director

P. O. Box 10009
Richmond, Virginia 23240-0009
(804) 762-4000
TDD # (804) 762-4021

Ms. Karen L. Jones
Arthur D. Little, Inc.
Crystal Square Five Suite 1007
1755 Jefferson Davis Highway
Arlington, Virginia 22202

Re: Real Estate Inquiry concerning the U.S. Army Woodbridge Research Facility, located on Dawson Beach Rd., Prince William County, Virginia

Dear Ms. Jones:

In response to your recent inquiry, we have undertaken a search of our computerized files as they might relate to the above referenced property site. Because these files are organized by either zip code or city/county, we provide the following information on the site in question within our ability to search available office resources. The following information is not a substitute for a site-specific environmental audit since these files only include information available to us and may not reflect the result of unreported conditions.

Upon searching our solid waste, hazardous waste, Superfund, and current investigation data files, we have located the following information.

The site in question is a United States military or other federal installation. Federal installations have often been the site of hazardous materials and/or waste incidents which we do not have on record.

Within the zip code area or closely adjacent areas of the site of interest are the following facilities for which the U. S. Environmental Protection Agency has notified this office as being handlers of hazardous wastes. Some of these listings were protective filings and these companies may not have generated hazardous waste at their specific sites. In addition many of the listings may reflect businesses which have ceased operation.

DALE CLEANERS	2902 DALE BLVD	WOODBRIDGE	22193
DIRK-WILSON INC (JIFFY LUB	8786 CENTREVILLE RD	MANASSAS	22193
HIBBARD, GERALD	2850 DALE BLVD	WOODBRIDGE	22193
KMART #3512	2851 DALE BLVD	WOODBRIDGE	22193
PRESTIGE STATIONS, INC	4110 DALE BLVD	DALE CITY	22193
ROYAL VALET	4138 DALE BLVD	DALE CITY	22193
BETTY BRITE CLEANERS	14502 SMOKETOWN RD	WOODBRIDGE	22192
CLASSIC AUTO BODY INC	3707 DAVIS FORD RD	WOODBRIDGE	22192
CREST CLEANERS INC	2243-A OLD BRIDGE RD	WOODBRIDGE	22192
CREST CLEANERS INC	2243 OLD BRIDGE RD	WOODBRIDGE	22192
CREST CLEANERS INC	12439 HEDGES RUN DR	WOODBRIDGE	22192
DALE CITY AUTO BODY, INC.	14007 TELEGRAPH RD	WOODBRIDGE	22192
FESTIVAL CLEANERS	12452 DILLINGHAM SQ	WIIDBRIDGE	22192
IKEA VIRGINIA INC	POTOMAC MILLS MALL	WOODBRIDGE	22192
PROFESSIONAL AUTO PAINT &	14011 TELEGRAPH RAOD	WOODBRIDGE	22192
SON'S CUSTOM CLEANERS	3264 DAVIS FORD RD	WOODBRIDGE	22192
SUNOCO	3125 DAVIS FORD RD	WOODBRIDGE	22192
THE DRYCLEANERS	12794 DARBY BROKE CT	WOODBRIDGE	22192
TRANSMISSION SPECIALISTS	14711 POTOMAC MILLS RD	WOODBRIDGE	22192
7-ELEVEN #26941	15621 JEFFERSON DAVIS HWY	WOODBRIDGE	22191
BEDSOLE, GENE STEPHEN	13313 OCCAQUAN RD	WOODBRIDGE	22191
BELVOIR AMC JEEP RENAULT	14120 JEFFERSON DAVIS HWY	WOODBRIDGE	22191
BETHLEHAM STEEL CORP	1255 FEATHERSTONE RD	WOODBRIDGE	22191
BRIDGE TAILORS & DRY CLEAN	13438 JEFFERSON DAVIS HWY	WOODBRIDGE	22191
CHEVRON USA, INC	13452 JEFFERSON DAVIS HWY	WOODBRIDGE	22191
CORVETTE REPAIR	15002 FARM CREEK DR	WOODBRIDGE	22191
COWLES FORD INC	13494 JEFFERSON DAVIS HWY	WOODBRIDGE	22191
CREST CLEANERS INC	13919 JEFFERSON DAVIS HWY	WOODBRIDGE	22191
DIRK-WILSON INC (JIFFY LUB	13319 OCCOQUAN RD	WOODBRIDGE	22191
DISCOUNT CLEANERS	14796 BUILD AMERICA DR	WOODBRIDGE	22191
DOMINION X-RAY & MEDICAL S	13536 JEFFERSON DAVIS HWY	WOODBRIDGE	22191
DOMINION X-RAY INC	14847 PERSISTENCE DRIVE	WOODBRIDGE	22191
DON'S PRECISION HEADS INC	1030-C CANNONS COURT	WOODBRIDGE	22191
DYNATECH COMMUNICATIONS	991 ANNAPOLIS WAY	WOODBRIDGE	22191
FEATHERSTONE CLEANERS	14639 JEFFERSON DAVIS HWY	WOODBRIDGE	22191
GOODYEAR AUTO SERVICE CENT	13701 JEFFERSON DAVIS HWY	WOODBRIDGE	22191
GORDON PLAZA CLEANER	13289A GORDON BLVD	WOODBRIDGE	22191
HOLLY ACRES TRAVEL TRAILER	2808 DAVID FORD ROAD	WOODBRIDGE	22191
JACK KLAWANS CHEVROLET INC	15605 JEFFERSON DAVIS HWY	WOODBRIDGE	22191
KWALITY CLEANERS	13309 OCCOQUAN ROD	WOODBRIDGE	22191
LEMORE CORPORATION	1311-13 G ST	WOODBRIDGE	22191
LUSTINE TOYOTA	14227 JEFFERSON DAVIS HWY	WOODBRIDGE	22191
LYNWOOD 66 SERVICE	14501 JEFFERSON DAVIS HWY	WOODBRIDGE	22191
NICHOLS, PAUL & DAKIS, ROB	2199 OLD BRIDGE RD	WOODBRIDGE	22191
NORTHERN VA COMM COLL	15200 NEABSCO MILLS RD	WOODBRIDGE	22191
OCCOQUAN MARINA SUN OIL CO	--- NOT GIVEN ---	WOODBRIDGE	22191
OK BODY SHOP	14218 JEFFERSON DAVIS HWY	WOODBRIDGE	22191
PAINT BY CHIP	1220 CANNONS CT	WOODBRIDGE	22191
PARK'S CLEANERS	14430 JEFFERSON DAVIS HWY	WOODBRIDGE	22191

PHANS AUTO BODY & PAINT	15004 FARM CREEK DR	WOODBRIDGE	22191
POTOMAC AUTO BODY	14550 JEFFERSON DAVIS HWY	WOODBRIDGE	22191
PRESTIGE STATIONS, INC	15550 SMOKETOWN RD	WOODBRIDGE	22191
R & R AUTO BODY INC	14858 FARM CREEK DR	WOODBRIDGE	22191
RAMS AUTO BODY	15526 NEABSCO MILLS RD	WOODBRIDGE	22191
RICHARDS AUTO BODY	15532G SMOKETOWN ROAD	WOODBRIDGE	22191
ROY DELGADO & ASSOCIATES I	14721 INDUSTRY COURT	WOODBRIDGE	22191
SHERWIN - WILLIAMS CO.	MARUMSCO PLZ SHPG CTR 1380	WOODBRIDGE	22191
SUNOCO	13731 JEFFERSON DAVIS HWY	WOODBRIDGE	22191
SUNOCO	13300 OCCOQUAN RD	WOODBRIDGE	22191
SUNOCO	14803 JEFFERSON DAVIS HWY	WOODBRIDGE	22191
SUNOCO	13400 JEFFERSON DAVIS HWY	WOODBRIDGE	22191
T. J. CLEANERS	13670 JEFFERSON DAVIS HWY	WOODBRIDGE	22191
TOWN AND COUNTRY BUICK	1108 HORNER RD	WOODBRIDGE	22191
U S ARMY - WOODBRIDGE RESE	DAWSON BEACH ROAD	WOODBRIDGE	22191
VIRGINIA POWER	1901 REDDY DR	WOODBRIDGE	22191
WARNER, JOHN M	13254 JEFF DAVIS HWY	WOODBRIDGE	22191
WOODBRIDGE AUTO BODY INC	1830 WOODBRIDGE ROAD	WOODBRIDGE	22191
WOODBRIDGE CLEANERS	13417 JEFFERSON DAVIS HWY	WOODBRIDGE	22191
WOODBRIDGE LINCOLN MERCURY	14655 JEFFERSON DAVIS HWY	WOODBRIDGE	22191
WOODBRIDGE NISSAN CORP	14777 JEFFERSON DAVIS HWY	WOODBRIDGE	22191

The following sites in the area of interest are on the U.S. EPA CERCLIS (Superfund) List:

UNITED FIBER GLASS INC	FEATHERSTONE INDUSTRIAL PA	WOODBRIDGE	22191
USA WOODBRIDGE RESEARCH FA	TO BE OBTAINED	WOODBRIDGE	22191

The following solid waste sites are in our records as being in the city or county of interest (Latitude & Longitude are included where available):

INDEPENDENT HILL LF-PR WIL	CO RT 234	PR WILLIAM	N38-25-30 W77-30-30
CHERRY HILL LF	RT 635E	PR WILLIAM	N38-33-30 W77-16-30
QUANTICO MCB LF		PR WILLIAM	
GEORGE AYOOB		PR WILLIAM	
RAYS DEBRIS LF	HORNER RD	PR WILLIAM	
THORNTON HILL #1		PR WILLIAM	
HYLTON ENTERPRISES		PR WILLIAM	
HILL DEBRIS #2		PR WILLIAM	
QUANTICO LF	RT 610	STAFFORD	
POTOMAC DEBRIS LF		PR WILLIAM	
FAUGHT CONST CO LF	RT 610	PR WILLIAM	
VA POWER DEBRIS LF	COCKPIT RD	PR WILLIAM	
STAFFORD CO LF	RT 628	STAFFORD	

The following are incidents in the area of interest in our computerized file

JUNKYARD	14814 DALEY LANE	PRINCE WILLIAM	22193
BANKS AUTO PARTS	13805 SMOKETOWN ROAD	WOODBRIDGE	22192
OCCOQUAN ELEM. SCHOOL	12915 OCCOQUAN RD., WOODBR	PRINCE WILLIAM	22192
WOODBRIDGE MOBIL GAS STATI	1930 DAVIS FORD RD., WOODB	PRINCE WILLIAM	22192
QUARLES PETROLEUM	14501 JEFFERSON DAVIS HWY.	PRINCE WILLIAM	22192
WOODBRIDGE BANKS AUTO PART	13805 SMOKE TOWN ROAD, WOO	PRINCE WILLIAM	22192
CAFRITZ GROUP	13805 SMOKETOWN RD., NEAR	PRINCE WILLIAM	22192
LAIDLAW ENVIRONMENTAL SPIL	I-95 @ MILEPOST 162	PRINCE WILLIAM	22192
DOMINION X-RAY	DOMINION X-RAY, 14847 PERS	PRINCE WILLIAM	22191
SPRIGGS RD./ D & K AUTO BO	POWELLS CREEK, DUMFRIES	PRINCE WILLIAM	22191
POWELLS TOWING	15704 JEFF DAVIS HWY, WOOD	PRINCE WILLIAM	22191

The following are incidents which may be in the area of interest but are not indexed by zip code in our computerized file

NO FURTHER INCIDENT REPORTS ARE LISTED FOR THE AREA OF INTEREST

We cannot be more specific on location because our files are not indexed to locate specific geographic points. This file search in no way replaces a thorough site-specific investigation performed by a qualified environmental consultant.

Very truly yours,

Barry F. Wright, P.E.

BFW/agc

Appendix C: Regulatory Comments to the Draft Woodbridge Research Facility Installation CERFA Report

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

Richard N. Burton
Director

P. O. Box 10009
Richmond, Virginia 23240-0009
(804) 762-4000
TDD # (804) 762-4021

February 2, 1994

Robert P. Craig, P.E.
Environmental Engineer
Risk Management Division
Attn: AMSRL-OP-IN-RE
2800 Powder Mill Road
Adelphi, MD 20783-1145

RE: Woodbridge Research Facility

Dear Mr. Craig:

Thank you for your time on the telephone today regarding the Community Environmental Response Facility Act (CERFA) report for the referenced facility. As we discussed, the letter sent from K.C. Das of the DEQ to Lt. Col. Paul E. Wojciechowski of the Army Environmental Center on January 21, 1994, was intended to be a non-concurrence by DEQ with the existing CERFA document pending inclusion in the report of the additional information outlined in the January 21 letter. You stated that this letter was perceived as such, and that the contractor already has the additional activities underway.

We look forwarding to receiving your revised CERFA document sometime in the near future. If you have any questions, please feel free to contact me at (804) 762-4205, or Erica Dameron at (804) 762-4212. Thanks again for your time.

Sincerely,

Lisa A. Ellis

Lisa A. Ellis
Remedial Project Engineer
Federal Facilities Program

cc: Lt. Col. Paul E. Wojciechowski
U.S. Army
Department of the Army
U.S. Army Environemntal Center
Aberdeen Proving Ground, MD 21010-5401

Durwood Willis
Erica S. Dameron
Paul L. Spaulding
K.C. Das

COMMONWEALTH of VIRGINIA

RICHARD N. BURTON
DIRECTOR

DEPARTMENT OF ENVIRONMENTAL QUALITY

(804) 527-5000
TDD (804) 527-4261

February 10, 1994

Scott Hill
USAEC Project Officer
USAEC
Attn. SFIMAEC-BC
Bldg 4480
Aberdeen Proving Grounds, MD 21010-5401

Dear Mr. Hill;

As you may already know, the Department of Environmental Quality (DEQ) has recently created a new unit within the Waste Division to work on BRAC issues. I have been assigned to work on the Woodbridge Research Facility (WRF). My review of the WRF files was completed yesterday (February 9, 1994). As part of that review I have reviewed the Draft BCP and the CERFA PA. Although I am uncertain about the appropriateness of the timing, I am submitting my comments on the CERFA PA in this correspondence. Any information regarding target dates for document submissions to the DEQ BRAC unit and your expected response times for comments on these documents would be greatly appreciated. If there are any CERFA documents which pre-date the CERFA PA I would appreciate it if I could get a copy of them.

My comments on the CERFA PA are presented following the organizational format of the CERFA PA document. Comments:

1) Section 2.1 - Existing Investigation Documents

I do not have a copy of the Enhanced Preliminary Assessment (March 1992). If copies are available would you please send one?

It is my understanding that the Draft Final Work Plan is still being commented on. Once the Draft Final Work Plan is finalized there may be changes from the draft that would affect the CERFA PA. What is the plan for reviewing the final Work Plan and incorporating changes to the CERFA PA?

2) Section 4.1.1 Drainage Ditch (AREE 22)

On October 29, 1993 DEQ comments and data were submitted to Mr Bob Craig (ARL) describing DEQ's findings and concerns about off site migration of contaminants from AREE 22. These comments indicated that additional work was needed to identify human health risks and environmental impacts. The DEQ data show that sediment concentrations of PCB at the current Northeastern boundary of AREE 22 are approximately 7 ppm. These data indicate that the plume of PCBs, and perhaps other contaminants, from AREEs 17 and 22 extended beyond the current boundary for AREE 22. The immediate receptors of this plume would be the wetlands system and associated biota South of AREE 22. Without further sampling data on the sediments and biota of this wetlands system there is insufficient grounds to assume that the system is "clean". Concerns about including this wetlands system in CERFA clean parcel 12P is that if the area were established as a wildlife area, and the wetlands system were fished there may be elevated levels of risk associated with the consumption of contaminated fish tissues. Until additional sediment and biota data are available for the wetlands system below AREE 22, this portion of CERFA parcel 12P should be designated as a CERFA-Disqualified parcel.

3) Section 4.1.5 - 5D-HR Landfill Area

If logistics permit, I would like to visit the site and observe the landfill trenching operations.

4) Section 4.1.6 - 6D-HR Landfill No. 1

The description of this site should be modified to include the DEQ soil, surface water, sediment, and tissue data transmitted to Mr. Bob Craig.

5) Section 4.5.1 - Landfill Areas

The description of the PCB contamination of the groundwater at Landfills 1 and 2 should be modified to reflect that the PCB concentrations are above the Virginia Water Quality Standards and the EPA-III RBC for drinking water.

6) Section 4.7 - CERFA parcels - CONUS Communications Network

The information presented is insufficient to conclude that there were not PCB spills in the test fields from exploding capacitors. Of primary concern to this office is the fact that anecdotal reports from facility personnel (May 1993) reported that capacitor explosions during lighting strikes commonly dispersed oil into the test fields. Capacitors were specifically

mentioned. Facility personnel reportedly would remove them and dispose of them in Old Landfill 1. Additional characterization of these test fields should be done before designating them as CERFA clean.

7) Section 4.7 - CERFA parcels - Buried Wire (AREE 27)

The Draft BCP indicates that the buried wire may have also contained PCBs in the shielding.

8) Section 4.7 - CERFA parcels - Additional Concerns

In light of comment #2, the lack of characterization in the wetlands of CERFA parcel 12-P should be highlighted as a concern.

9) Table 5-1

AREE 22 should be expanded to include the wetlands in CERFA parcel 12-P. Concurrently CERFA parcel 12P should be revised to exclude the wetlands system associated with AREE 22.

I realize these comments are somewhat last minute in the scheme of things, but recent events within DEQ have made it unavoidable. The formation of the BRAC unit should eliminate this problem in the future. In the mean time, if you have any questions regarding the enclosed please call me at 804-527-5095.

Sincerely,

David Grimes
Environmental Program
Planner - BRAC unit

cc Durwood Willis - DEQ BRAC unit

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

Richard N. Burton
Director

P. O. Box 10009
Richmond, Virginia 23240-0009
(804) 762-4000
TDD # (804) 762-4021

January 21, 1994

Lt. Col. Paul E. Wojciechowski
U. S. Army
Department of the Army
U. S. Army Environmental Center
Aberdeen Proving Ground, Maryland 21010-5401

Re: Woodbridge Research Facility

Dear Col. Wojciechowski:

The Virginia Department of Environmental Quality has reviewed the draft Community Environmental Response Facilitation Act (CERFA) report which was received on November 3, 1993. This report identified the real property at Harry Diamond Laboratories, Woodbridge Research Facility, Woodbridge, Virginia, on which no hazardous substances and no petroleum products, or their derivatives, were stored for one year or more, or are known to have been released or disposed.

Based on our review of the document, it appears that certain federal, state and local government regulatory records have not been reviewed. Specifically, the record search did not include state hazardous wastes files and state water files, other than those related to leaking underground storage tanks. In addition, it is not clear whether a review of all of the installation's records concerning state and local government regulatory compliance was completed. Please include this information, as well as any information concerning citizen complaints or inquiries, in the next draft of the report.

According to the report windshield and walking tours were made of the installation. However, pursuant to Section 120(h)(4)(A)(iv) and (v) of CERFA, a visual inspection of the real property and any buildings, structures, equipment, pipe, pipeline or other improvements on the real property, a visual inspection of properties immediately adjacent to the real property, and a physical inspection of property adjacent to the real property, to the extent permitted by owners or operators of such property, must

be included in the identification of uncontaminated property. The windshield and walking tours referenced in the report do not meet these requirements.

In order for the Commonwealth to concur with your recommendations, and in order to satisfy CERFA requirements relative to the identification of uncontaminated parcels, the above mentioned information should be incorporated into the report.

Should you have any questions concerning this, please do not hesitate to call Ms. Erica S. Dameron at (804) 762-4212.

Sincerely,

K. C. Das, Director
Office of the Superfund Program

/jpb

cc: Michael P. Murphy
Erica S. Dameron
Paul L. Spaulding

14 APR 1994

USAEC Response to Commonwealth of Virginia Department of Environmental Quality Comments to Woodbridge Research Facility CERFA Document

Comments Dated February 10, 1994:

1. **COMMENT:** *Section 2.1 - Existing Investigation Documents*

   I do not have a copy of the Enhanced Preliminary Assessment (March 1992). If copies are available would you please send one.

   It is my understanding that the Draft Final Work Plan is still being commented on. Once the Draft Final Work Plan is finalized there may be changes from the draft that would affect the CERFA PA. What is the plan for reviewing the final Work Plan in incorporating changes to the CERFA PA?

   RESPONSE: Concur: Final Enhanced Preliminary Assessment was provided to Mr Grimes, VADEQ at the February BRAC Clean-up Team meeting. The CERFA report will include the most current information available at the time of its finalization to include information available in the Site Inspection/Remedial Investigation Workplans.

2. **COMMENT:** *Section 4.1.1 Drainage Ditch (AREE 22)*

   On October 29, 1993 DEQ comments and data were submitted to Mr Bob Craig (ARL) describing DEQ's findings and concerns about off site migration of contaminants from AREE 22. These comments indicated that additional work was needed to identify human health risks and environmental impacts. The DEQ data show that sediment concentrations of PCB at the current Northeastern boundary of AREE 22 are approximately 7 ppm. These data indicate that the plume of PCBs, and perhaps other contaminates, from AREEs 17 and 22 extended beyond the current boundary for AREE 22. The immediate receptors of this plume would be the wetlands system and associated biota South of AREE 22. Without further sampling data on the sediments and biota of this wetlands system there is insufficient grounds to assume that the system is "clean". Concerns about including this wetlands system in CERFA clean parcel 12P is that if the area were established as a wildlife area, and the wetlands system were fished there may be elevated levels of risk associated with the consumption of contaminated fish tissues. Until additional sediment and biota data are available for the wetlands system below AREE 22, this portion of CERFA parcel 12P should be designated as a CERFA Disqualified parcel.

   RESPONSE: Concur: Based on the data provided by the Commonwealth, the wetlands system in question will be designated as a CERFA Disqualified parcel.

3. **COMMENT:** *Section 4.11.5 - 5D-HR Landfill Area*

If logistics permit, I would like to visit the site and observe the landfill trenching operations.

RESPONSE: Concur: Site visits will be coordinated so as to afford the Commonwealth representative and other interested visitors the opportunity to observe field investigations.

4. **COMMENT:** *Section 4.5.6 - 6D-HR Landfill No. 1*

The description of this site should be modified to include the soil, surface water, sediment, and tissue data transmitted to Mr. Bob Craig.

RESPONSE: Concur: The site description will be modified to represent the referenced data.

5. **COMMENT:** *Section 4.5.1 - Landfill Areas*

The description of the PCB contamination of the groundwater at landfills 1 and 2 should be modified to reflect that the PCB concentrations are above the Virginia Water Quality Standards and the EPA-III RBC for drinking water.

RESPONSE: Concur: The site description will be modified to indicate status of PCB concentrations with respect to referenced standards.

6. **COMMENT:** *Section 4.7 - CERFA parcels - CONUS Communications Network*

The information presented is insufficient to conclude that there were not PCB spills in the test fields from exploding capacitors. Of primary concern to this office is the fact that anecdotal reports from facility personnel (May 1993) reported that capacitor oil into the test fields. Capacitors were specifically mentioned. Facility personnel reportedly would remove them and dispose of them in Old Landfill 1. Additional characterization of these test fields should be done before designating them as CERFA clean.

RESPONSE: Non-concur: The U.S. Army was required to conduct the CERFA seven step protocol found in Public Law 102-426 to reach determinations of "uncontaminated" property. The Army believes that it has conducted the designation of "uncontaminated" parcels in accordance with this process. The Army does not believe it was Congress's intent to eliminate parcels which could be designated as "uncontaminated" based on supposition. Currently the best information available indicates that spark arrestors were not oil filled. As such, the parcel should remain identified as CERFA clean.

7. **COMMENT:** *Section 4.7 - CERFA parcels - Buried Wire (AREE 27)*

The Draft BCP indicates that the buried wire may have also contained PCBs in the shielding.

RESPONSE: Non-concur: The U.S. Army was required to conduct the CERFA seven step protocol found in Public Law 102-426 to reach determinations of "uncontaminated" property. Currently the best information available concerning the buried wire indicates that the testing wire did not contain PCBs in the shielding. As such, the parcel should remain identified as CERFA clean. See response to comment 6 above.

8. **COMMENT:** *Section 4.7 - CERFA parcels - Additional Concerns*

In light of comment #2, the lack of characterization in the wetlands of CERFA parcel 12-P should be highlighted as a concern.

RESPONSE: Concur: The wetlands system referenced in comment number 2 has been redesignated as CERFA Disqualified and will be addressed as a site of concern in the ongoing environmental investigations.

9. **COMMENT:** *Table 5-1*

AREE 22 should be expanded to include the wetlands in CERFA parcel 12-P. Concurrently CERFA parcel 12P should be revised to exclude the wetlands system associated with AREE 22.

RESPONSE: Concur: The wetlands system referenced in comment #2 will be designated as a CERFA Disqualified parcel related to AREE #22.

Comments Dated January 21, 1994:

1. **COMMENT:** *It appears that certain federal, state and local government regulatory records have not been reviewed.*

RESPONSE: Concur: Review of additional files and records were conducted since the draft CERFA report. Information from these files and records will be incorporated and referenced into the final version of the CERFA report.

2. **COMMENT:** *The windshield and walking tours referenced in the report do not meet the requirements of Section 120(h)(4)(A)(iv) and 120(h)(4)(A)(v) of CERFA.*

RESPONSE: Non-concur: The actual field efforts conducted were designed to fully satisfy the referenced requirements. The description of these efforts provided in the draft CERFA report did not adequately describe the actual efforts conducted. A more accurate description of the actual field efforts is provided in the revised document; this revised description more closely tracks the language in Section 120(h)(4)(A)(iv) and 120(h)(4)(A)(v) of CERFA.