

AN ARCHEOLOGICAL OVERVIEW AND MANAGEMENT PLAN FOR THE
HARRY DIAMOND LABORATORIES ADELPHI MARYLAND(U)
ENVIROSPHERE CO NEW YORK W M GARDNER ET AL. JUL 85

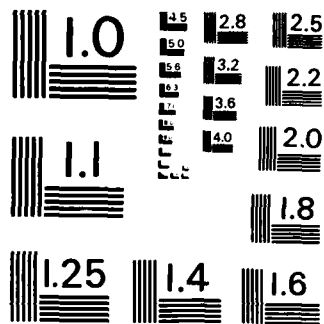
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**Final
Report No. 12**
July 1985

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**An Archeological Overview and Management Plan
for the Harry Diamond Laboratories -
Adelphi, Maryland**

Under Contract CX4000-3-0018
with the

**National Park Service
U.S. Department of the Interior**
Philadelphia, Pennsylvania 19106

for the
U.S. Army Materiel Development and
Readiness Command

by

Thunderbird Archeological Associates, Inc.
Front Royal, Virginia 22630

and

Envirosphere Company
2 World Trade Center
New York, New York 10048

Prepared under the Supervision of

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distribution is unlimited.

Joel I. Klein, Principal Investigator
Envirosphere Company

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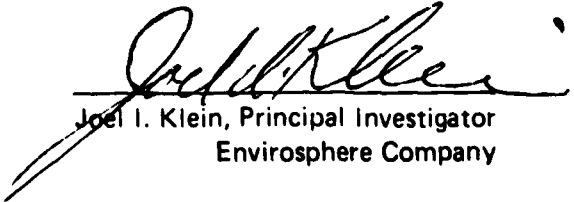
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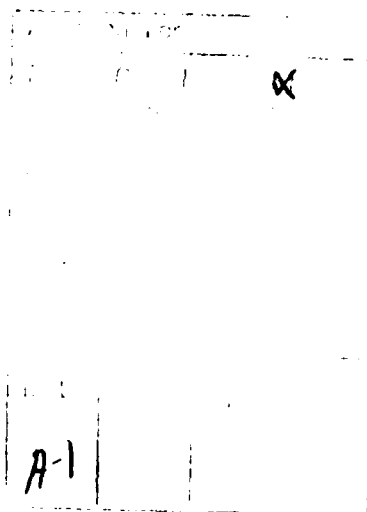
REPORT DOCUMENTATION PAGE		1. REPORT NO.	2.	3. Recipient's Accession No.
4. Title and Subtitle An Archaeological Overview and Management Plan for the Harry Diamond Laboratories - Adelphi, Maryland		5. Report Date July, 1985		6.
7. Author(s) William M. Gardner, James L. Nolan, Edward Otter and Joel I. Klein		8. Performing Organization Rept. No. DARCOM Report No. 12		
9. Performing Organization Name and Address Envirosphere Company 2 World Trade Center New York, New York 10048		10. Project/Task/Work Unit No.		11. Contract(C) or Grant(G) No. (C) CX 4000-3-0018 (G)
12. Sponsoring Organization Name and Address National Park Service Mid-Atlantic Regional Office 600 Arch Street Philadelphia, PA 19106		13. Type of Report & Period Covered Final Report		14.
15. Supplementary Notes This report was prepared as part of the DARCOM Historical Archeological Survey (DHAS), an interagency technical services program to develop facility-specific archeological overviews and management plans for the U.S. Army Material Development and Readiness Command (DARCOM).				
16. Abstract (Limit: 200 words) This archeological overview and management plan provides a tool which can be used by DARCOM and decision-makers at the Harry Diamond Laboratories - Adelphi, Maryland to assist in complying with regulations and procedures relating to historic preservation (<u>Technical Manual 5-801-1</u> ; <u>Technical Note No. 78-17</u> ; <u>Resources Management</u> ; 32 CFR 650.181-650.193; <u>Army Regulation 420-40</u> ; <u>Army Regulation 200-1</u> ; <u>Army Regulation 200-2</u> ; 36 CFR 800). This document summarizes data relating to the area's environmental history; previous archeological surveys; presently identifiable archeological resources; known artifact, ecofact, and/or documentary collections relating to archeological resources; potentially identifiable but not presently recorded archeological resources; significant archeological resources; ongoing and planned activities that could affect archeological resources; locational data of known archeological resources; and locational data of potential archeological resources. One historical archeological site is known to exist at the Harry Diamond Laboratories - Adelphi, Maryland. This is a mill race associated with Mrs. Harper's Woolen Factory. This site is not considered significant. In addition, prehistoric sites may exist in undisturbed areas of the facility, though these are not likely to be significant. Recommended studies include: 1) surveying undisturbed areas of the facility for archeological resources; 2) reviewing facility publications and orientation procedures to include mention of DARCOM's historic preservation responsibilities; and 3) establishing an on-call relationship with an entity capable of delivering professional archeological consulting services to deal with the unanticipated discovery of archeological remains.				
17. Document Analysis a. Descriptors Archeological Management Army Installation Management Environmental Analysis b. Identifiers/Open-Ended Terms Cultural Resource Management Archeological Resource Management The Harry Diamond Laboratories - Adelphi, Maryland c. COSATI Field/Group				
18. Availability Statement: Available for public release without appended site locational data		19. Security Class (This Report)		21. No. of Pages xi+65
		20. Security Class (This Page)		22. Price

MANAGEMENT SUMMARY

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Recommended studies include: 1) surveying undisturbed areas of the facility for archeological resources; 2) revising facility publications and orientation procedures to include mention of DARCOM's historic preservation responsibilities; and 3) establishing an on-call relationship with an entity capable of delivering professional archeological consulting services to deal with the unanticipated discovery of archeological remains.



PREPARERS AND QUALIFICATIONS

William M. Gardner directed Thunderbird Archeological Associates, Inc. in data collection and analysis for this overview. He holds a Ph.D. degree in Anthropology and is a Professor at Catholic University of America in addition to being President of Thunderbird Archeological Associates, Inc. Dr. Gardner has had extensive experience in archeological research and cultural resource management in the Mid-Atlantic region.

James L. Nolan is Assistant Technical Manager for the DARCOM project, responsible for day-to-day operations. He is the principal author of this archeological overview and management plan. He holds a BA degree in English and Anthropology, a Ph.D. in Anthropology, and an MBA in Finance. Over the past 12 years, Dr. Nolan has participated in excavation, analysis, management and reporting of many archeological projects in the northeastern and southwestern United States as well as in Peru. He is currently an Engineer with Envirosphere Company.

Edward Otter participated in the data collection and report preparation phases of this overview. He received BA and MA degrees in Anthropology and is currently working toward a Ph.D. in Anthropology. He has worked on numerous archeological projects in the Mid-Atlantic region.

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ACKNOWLEDGEMENTS

This archeological overview and management plan could not have been written without the cooperation of Robert J. Gunther, Jim Shropshire, Ralph M. Peck, Milton Brown, John Ganz and Rodney Metzger of the Harry Diamond Laboratories. All gave generously of their time and provided essential data relating to the history of the facility's development.

Stephanie Rodeffer, National Park Service, provided guidance throughout the course of this project.

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1.0
INTRODUCTION

1.1 PURPOSE AND NEED

This archeological overview and management plan will assist the U.S. Army Materiel Development and Readiness Command (DARCOM) in its efforts to comply with laws and regulations concerning the management of archeological resources at the Harry Diamond Laboratories - Adelphi, Maryland (HDLA).

The National Historic Preservation Act of 1966 as amended (94 Stat. 2988) affirmed the policy of the federal government (Sec. 2(3)) to "administer federally owned, administered or controlled prehistoric and historic resources in a spirit of stewardship for the inspiration and benefit of present and future generations." Section 110(a)(1) of that code specifies that each federal agency is responsible for the preservation of such resources on agency-owned or controlled lands. DARCOM is committed to the implementation of that policy, following the guidelines for historic resource management set forth in the 1966 Act and related laws, regulations, and technical guidance.

DARCOM has contracted with the U.S. Department of the Interior's National Park Service to provide technical guidance for the development of DARCOM installation cultural resource overviews and management plans. The program is entitled the DARCOM Historical/Archeological Survey (DHAS). The National Park Service has in turn separated this review and planning program into two major elements, architectural and archeological. The architectural review and planning function is being directed by the Service's Historic American Buildings Survey (HABS), while the archeological resource assessment and planning function is being handled through the Service's Interagency Resource Management Division (IRMD). The archeological function includes both prehistoric and historical archeology.

Under the requirements of the National Historic Preservation Act (NHPA) of 1966 as amended (80 Stat. 915, 94 Stat. 2987; 16 USC 470), DARCOM must:

- inventory, evaluate, and where appropriate nominate to the National Register of Historic Places all archeological properties under agency ownership or control (Sec. 110(a)(2))
- prior to the approval of any ground-disturbing undertaking, take into account the project's effect on any National Register -

listed or eligible property; afford the Advisory Council on Historic Preservation a reasonable opportunity to comment on the proposed project (Sec. 106)

- complete an appropriate data recovery program on an eligible or listed National Register archeological site prior to its being heavily damaged or destroyed (Sec. 110(b), as reported by the House Committee on Interior and Insular Affairs [96th Congress, 2d Session, House Report No. 96-1457, p. 36-37])

Since the passage of the National Historic Preservation Act Amendments of 1980, DARCOM has begun a more active commandwide program in historic resource management. DARCOM's management program involves several steps. The first step is a literature review and preliminary evaluation of known cultural resources on DARCOM facilities. This provides a basis for prediction of the overall resource base requiring management. The second step involves applying the understood parameters of the resource base in a plan which takes into consideration both short- and long-term command activities and goals.

Other compliance regulations taken into consideration by this archeological overview and management plan include:

- o The Archeological and Historic Preservation Act of 1974 (88 Stat. 174, 16 USC 469), which requires that notice of an agency project that will destroy a significant archeological site be provided to the Secretary of the Interior; either the Secretary or the notifying agent may support survey or data recovery programs to preserve the resource's information values.
- o The Archeological Resources Protection Act of 1979 (93 Stat. 721, 16 USC 470aa; this supersedes the Antiquities Act of 1906 [93 Stat. 225, 16 USC 431-43]), with provisions that effectively mean that
 - The Secretary of the Army may issue excavation permits for archeological resources on DARCOM lands (Sec. 4)
 - Anyone damaging an archeological resource on DARCOM lands may incur criminal (Sec. 6) or civil penalties (Sec. 7)
- o 36 CFR 800, "Protection of Historic and Cultural Properties" (44 FR 6068, as amended in May 1982); these regulations from the Advisory Council on Historic Preservation set forth procedures for compliance with Section 106 of the National Historic Preservation Act
- o Regulations from the Department of the Interior setting forth procedures for determining site eligibility for the National Register of Historic Places (36 CFR 60, 36 CFR 63), procedures

for implementing the Archeological Resources Protection Act (43 CFR 7) (also published as Department of Defense regulation 32 CFR 299), and the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation (48 FR 44716).

- o Guidance from the U.S. Department of the Army as to procedures and standards for the preservation of historic properties (32 CFR 650.181-650.193; Technical Manual 5-801-1; Technical Note 78-17; Army Regulation 420-40; Army Regulation 200-1; Army Regulation 200-2).

The formulation of archeological plans for DARCOM installations is part of a developing national acceptance of the Historic Resource Protection Planning Process (RP3) (HCRS 1980). RP3 presents an outline for the development of preservation plans, which, in turn, provide an analytical structure for preservation decision-making. This archeological overview and management plan has been prepared with those guidelines in mind.

1.2 HARRY DIAMOND LABORATORIES - ADELPHI, MARYLAND.

The Harry Diamond Laboratories - Adelphi, Maryland (HDLA), one of seven laboratories of the US Army Electronics Research and Development Command (ERADCOM), is a complex of diverse facilities, with a staff having a broad competence in research, development, and engineering. HDLA is the principal developer of electronic fuzing for projectiles and missiles. Serving as the Army lead laboratory for fluidics and nuclear weapons effects technologies, HDL's programs include system hardening and vulnerability analysis. Applications of these research and development programs are productive in mortar, artillery, rocket and missile electronic fuzes, nuclear survivability, radar security systems, training devices, and analog signal processing equipment.

ERADCOM has sole responsibility for all of the Army's research and development tactical Intelligence, Surveillance, and Target Acquisition (ISTA) material resources. Included in this function is material for electronic countermeasures defeating the enemy's ISTA efforts as well as electronic fuzing of our weapons and electronics technology in general.

Harry Diamond Laboratories Headquarters is located in Adelphi, Maryland, a northeast suburb of Washington, D.C. (Figure 1-1). The Adelphi site consists of 21 buildings constructed between 1969 and 1977 on a 137 a. tract of gentle rolling to hilly land (Figure 1-2). The grounds and buildings are a well landscaped, campus-type installation. The grounds are bordered on the north by the Naval Surface Weapons Center. The west, east and south sides are developed with private residential and apartment buildings. Mean elevation of HDLA buildings is 325+ ft.

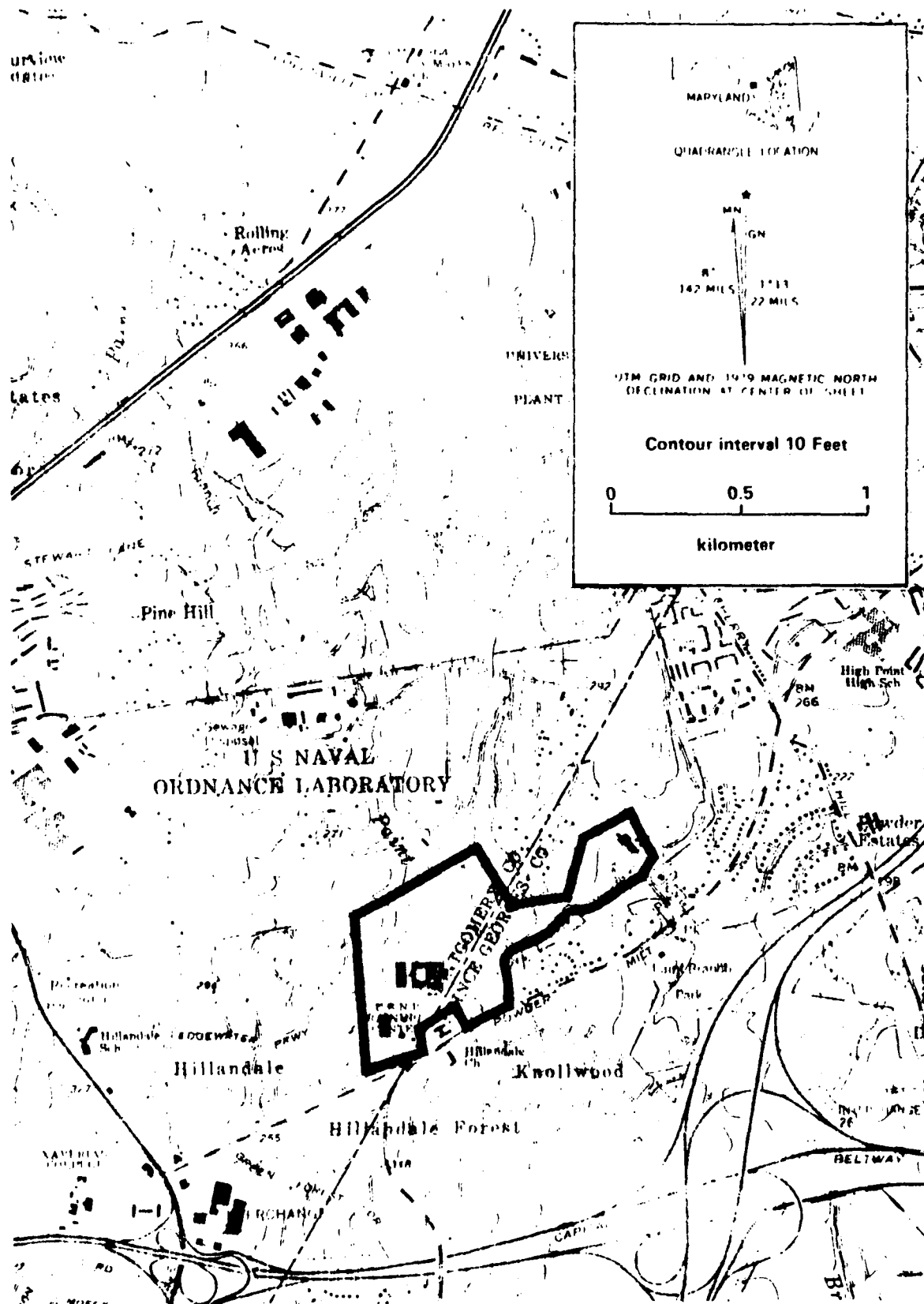


Figure 1-1. MAP OF THE GENERAL VICINITY OF THE HARRY DIAMOND LABORATORIES - ADELPHI, MARYLAND

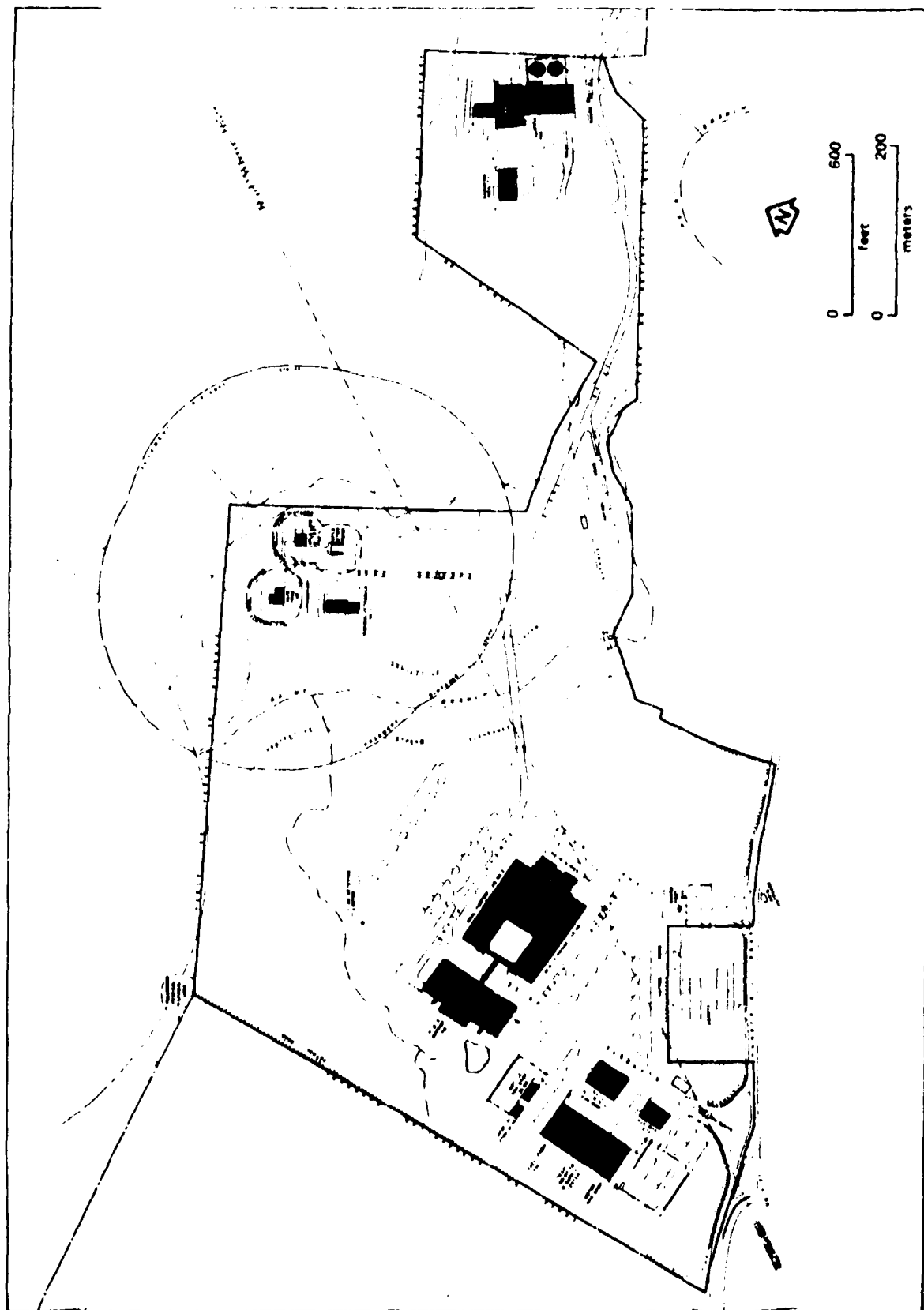


Figure 1-2. MASTER BASE MAP OF THE HARRY DIAMOND LABORATORIES - ADELPHI, MARYLAND.

The early history of the Harry Diamond Laboratories goes back to the genesis of the National Defense Research Committee in the late 1930's. The Committee undertook the development of proximity fuzes in the early 1940's. Early work on fuzes of various types indicated that those operating through the use of radio waves offered the most promise.

In furtherance of these findings, a group of scientists and engineers was formed at the National Bureau of Standards (NBS) to develop fuzes for non-rotating (e.g., fin-stabilized) munitions such as bombs, rockets, and mortar shells. This group was headed by Mr. Harry Diamond, a pioneer radio engineer. (Mr. Diamond had developed the airborne weather radiosonde, the ILS blind landing system for aircraft, the radio beacon system, and various other air navigation aids.) This group became the Ordnance Development Division of NBS. The major accomplishment of this group, the radio doppler proximity fuzes, has been called "...one of the outstanding scientific development of World War II...second only to the atomic bomb."

Following establishment of a special commission to examine the role of NBS in 1953, the Ordnance Development Division was transferred to the Department of the Army. The NBS group was renamed the Diamond Ordnance Fuze Laboratories (DOFL), a Class II installation under the office of the Chief of Ordnance, Army.

In 1962, when the technical services of the Army were combined under a major Army reorganization, DOFL was renamed the Harry Diamond Laboratories (HDL) and assigned a broadened mission as one of the five corporate laboratories of the US Army Material Command.

Since 1953, the Harry Diamond Laboratories have made a number of significant technical and scientific advances. These include a considerable quantity of military hardware advancing the technology in low-cost, ruggedized electronics; radar; fluidics; and nuclear irradiation effects on electronics. The overall thrust of HDL efforts in fuzing has been to reduce the cost of proximity fuzes while increasing their reliability.

The Harry Diamond Laboratories - Adelphi, Maryland is also the Headquarters, US Army Electronics Research and Development Command, (HQ. ERADCOM). HQ. ERADCOM was established 27 December 1977, and commenced their physical move to HDL's Adelphi, MD site on 3 January 1978.

1.3 SUMMARY OF PREVIOUS ARCHEOLOGICAL WORK ON HARRY DIAMOND LABORATORY-ADELPHI, MARYLAND

A number of prehistoric and historic sites have been reported in the vicinity of HDLA. Attempts have been made in the past to locate archeological materials on HDLA property but no cultural material was found during the two reported surveys.

On March 4, 1976, Bro. James McPike from the Archeological Society of Maryland and Mr. Bob Beardsley from the Montgomery County Archeological Society were provided with a tour of HDLA grounds so that they could survey for archeological materials. The men were interested in identifying the location of Mrs. Harper's Woolen Factory, depicted on an 1862 atlas as being in the area, and in finding prehistoric artifacts. No cultural material was found (Wardell 1976).

In 1981 a more formal survey of the Paint Branch was conducted by the Potomac River Archeological Survey for the Washington Suburban Sanitation Commission. Included in the survey area was that part of the Paint Branch located on HDLA property. What is believed to be the mill race for Mrs. Harper's Woolen Factory was located on the northern border of HDLA. The mill itself is a potential site. No other sites were located on HDLA ground during this survey (Cissna et al. 1982).

Other unidentified people have collected archeological materials from HDLA. No information is available as to who did the collecting, where or when it took place or exactly what was collected. The single reference states only that broken projectile points were found (McMaster et al. 1981).

1.4 THE SOCIO-CULTURAL CONTEXT OF THE ARCHEOLOGICAL RESOURCES AT THE HARRY DIAMOND LABORATORY - ADELPHI, MARYLAND

The area around HDLA has been sparsely populated until recently. The primary occupation of these early area residents was agriculture and light industry. Since World War II, the population has increased commensurate with the growth of the Washington, D.C., metropolitan area suburbs. The economics of the area changed accordingly, with a rise in governmental and professional office jobs in and around the city, and support services for those white collar workers. There is thus little continuity between the past and present Euroamerican populations.

As with these groups, there is little or no continuity between the prehistoric and modern communities of Native Americans. There are descendants of the early historic period Amerinds, the Piscataway, living in the general vicinity of the District of Columbia, especially in eastern and southeastern Prince Georges County, and adjacent Charles County. These people however, are not concentrated in any residential clusters but are dispersed throughout the general population (Feest 1978 a, b). In general they tend to occupy the lower level of the socio-economic structure having been the subject of considerable bias during the days of Maryland's triracialism. Within the last decade, there has been a resurgence of pride among the Piscataway commensurate with the general national Pan-Indian movement, although several factions have developed.

Because of the lack of continuity with the dominant population of the HDLA area, there would be little local interest in any site found on the grounds beyond the general interest of a mobile public in things historic. Certain groups, such as the Maryland Historical Society, the Prince Georges County Historical Society, the Maryland Historic Trust, the Archeological Society of Maryland, the Division of Archeology of the Maryland Geological Society and vocational and professional archeologists and historians, would be interested in any site found on HDLA property. The Trust and the Division of Archeology, as the state cultural resources management monitors, would, of course, have a vested interest. Any prehistoric burial which might be on the property would evoke the interest of at least one faction of the Piscataway Indians. It is assumed, on the basis of predictive variables and on our present knowledge of the property that any archeological site that might be found on the grounds would be small in scale and of limited scientific potential. Therefore, it is likely that any materials found would be of minimal significance or interest, even to the groups noted above.

2.0

AN OVERVIEW OF THE CULTURAL AND RELEVANT NATURAL HISTORY
OF THE HARRY DIAMOND LABORATORIES - ADELPHI, MARYLAND

2.1 THE PHYSICAL ENVIRONMENT

2.1.1 Earth Resources

Harry Diamond Laboratories-Adelphi, Maryland lies at the interface of the Piedmont and Coastal Plain physiographic provinces in an upland, inter-riverine setting. Soils indicative of both of these provinces are present on HDLA property. These soils consist of silty and gravelly loam underlain by a substratum of compacted silty and gravelly loam that is either impervious to water, or nearly so (Montgomery County Soil Survey 1960:2). As with most areas of the Piedmont, post A.D. 1700 deforestation and cultivation resulted in considerable soil loss through deflation, bringing about a general loss of all younger soils and most of the organic strata. Before construction took place on the grounds of HDLA, soil slopes ranged from 0-3% to over 45%.

The gravel deposits found on the facility are Pleistocene alluvial wash from the ancestral Potomac (Montgomery County Soil Survey 1960:8). These gravels contain lithic deposits whose origins are as far away as the Appalachian Plateau and, as a result, are composed of a variety of materials used by prehistoric populations such as quartz, quartzite, rhyolite, chert, jasper, and chalcedony. Two factors exist which could have restricted the use of these materials; cobble size and immediately local availability. The size of the gravels is described as being less than two in. (Kirby et al. 1967:59). Past experience has shown that this is not always the case, and quartz cobbles up to six in. in diameter were observed during a cursory examination of the facility in July, 1983. Local availability is not generally a problem either, as this material tends to be ubiquitous in the streams draining similar areas. Other locations for pebble and cobble lithics are erosional gullies and deflated hill tops.

Modern uses of the soil types present at HDLA include limited agriculture and construction fill. This latter is especially important in the use of the compact, gravelly sub-soil for road bedding. The proximity of the gravelly layer to the surface is a factor in agricultural suitability. Where this layer is close to the surface, shallow rooted crops such as corn and hay may be grown. Where this layer is deeper, crops with deeper roots such as tobacco may be raised. In all cases, care must be taken to prevent soil erosion and fertilization is

necessary. The steeper sloped areas should remain in tree cover since the removal of the trees would cause severe erosion.

2.1.2 Water Resources

Approximately 2000 ft. of Paint Branch Creek flow through HDLA land. Three tributaries of Paint Branch are also found on the property. Paint Branch is a second order stream which flows into Indian Creek, a tributary of the Anacostia River, which in turn empties into the Potomac River. The only other known water found on HDLA is a man-made pond on the west end of the facility.

2.1.3 Modern Climate

The modern climate at HDLA is influenced to a large part by the air circulation patterns of the area. In winter, the upper westerlies are just north of Maryland. This gives Maryland a predisposition toward a continental climate (Gale Research 1980:340). Because of the proximity of the upper westerlies in the winter, the wind generally blows from the northwest (Gale Research 1981:252). The result of this is cold winters with occasional episodes of warm and cold fronts moving through in rapid succession (Gale Research 1980:340).

In the summer months, warm air enters from the south. This air carries moisture from the Atlantic Ocean and is maintained by a semi-permanent high pressure system from the south (Gale Research 1980:340) with prevailing winds also coming from the south (Gale Research 1981:252).

The mean annual precipitation in the HDLA area is 41.66 in. Mean annual temperature for the years 1951 to 1971 is 56°F. July is the warmest month of the year with mean monthly temperatures of 77.50°F. These statistics were recorded at College Park, Maryland, less than two miles from HDLA. (Gale Research 1980:348).

2.1.4 Plant Resources

The area occupied by Harry Diamond Laboratories-Adelphi is included in the Oak-Hickory Forest biome described by Victor Shelford (1963). Dominant plant species include post oak, black oak, white oak, blackjack oak, mockernut hickory and shagbark hickory. The nuts of some of these species are suitable for human consumption. These trees would have produced nuts capable of supporting sizeable populations of various animal species. Hardwood trees still exist on the steeper portions of HDL.

2.1.5 Animal Resources

The most important animal species in terms of human diet that would have been found on HDLA ground would be mast feeding animals such as turkey and squirrel. Deer would have been present in the area as well. Other mammals that would have been found in the area are bear, raccoon, opossum, box turtle, and passenger pigeon. Skunk, woodrat and other

species would have been present also, but these animals would not have been important in human diets. If some of the land was unforested, there would have been larger populations of deer, rabbit and quail since these animals prefer forest/field ecotone settings.

The streams found on the facility would have furnished subsistence items as well. Besides providing a source of potable water for both people and animals, these streams would have yielded fish, frogs, crayfish, and perhaps turtles.

2.1.6 Paleoenvironment

The paleoenvironmental reconstruction presented below follows the work of Carbone (1976) and Dent (1978) as modified by Gardner (various). The bases for the reconstructions are pollen cores, paleontological deposits, various aspects of pedology and geomorphology, and archeological studies. The reconstruction is drawn from a number of areas in the general Middle Atlantic and not from the facility itself or the immediate vicinity. An allowance is, however, made for the physiographic setting of the facility (Table 2-1).

Late Glacial (12,700-10,500 BP). Compared with modern climate, the Late Glacial period was colder and wetter. Mean annual July temperature at the earlier part of the period was approximately 50F below the present July mean. Precipitation was greater than at present with the most notable difference occurring during the winter months. With the lowered annual mean temperatures, evaporation was also reduced. Change was, however, evident and marked from the beginning of this period as defined. The overall trend was toward increased warmth, reduced precipitation and increased evaporation in a general cline toward modern conditions, though without reaching them.

The glaciers at the beginning of this era had moved well north of Pennsylvania (they never reached south of the Delaware Water Gap, some distance to the north). At between 20-18,000 BP at the glacial maximum sea level was considerably lower. Hydrologically, the immediate local effect of this would have been to lower the water table and reduce the extent of the tidal limits. The Anacostia, which Paint Branch empties into, is now tidal. Twenty millenia ago, it would have been a deeply incised fresh water tributary of the Potomac, which in turn would have been a deeply incised confluent of the Susquehanna River instead of the Chesapeake Bay.

By the beginning of the Late Glacial, all of this had changed. Sea level was still somewhat lower but with complete drowning of the mouth of the Chesapeake Bay by 12-11,000 BP. Stream flow in the Coastal Plain tributaries would have decelerated and ponding of these same streams can be inferred. The down-cutting rate of the immediate Piedmont streams would have been reduced. Around 10,500 BP, the deposition of loess from the silt laden head of the Bay was declining (Foss et al. 1978) indicating some drowning of the Susquehanna Valley as far north as Havre de Grace, Maryland.

Table 2-1. A SUMMARY OF THE ENVIRONMENTAL HISTORY OF THE AREA OF THE HARRY DIAMOND LABORATORIES - ADELPHI, MARYLAND

Carbone 1976
(Middle Atlantic Region)
Pollen

Date	Inferred Climate
3500 BP- Present	Late Post Glacial/Modern climate; cooler and moister than Sub-Boreal; Chesapeake Bay and embayed tributaries at current levels; increase in chestnut in mast forests; includes: Sub-Atlantic, Scandic, Neo-Atlantic, Pacific climatic episodes.
8000- 3500 BP	Mid Post-Glacial climate
6000- 3500 BP	Sub-Boreal episode; "xerothermic" interval; warm and dry, but with fluctuations of temperature and rain-fall; increase in hickory leads to oak-hickory forest; increase in chestnut
8500- 6000 BP	Atlantic episode; "hypsaothermal" interval; warmer and moister than modern climate; more rapid sea level rise than earlier, and embayment of Chesapeake Bay and tributary mouths; mesic forest with oak dominance, but other nut bearing trees also present
10,500- 8500 BP	Early Post-Glacial climate (Pre Boreal and Boreal episodes); slightly warmer and drier than Late Glacial; melting northern glaciers cause sea level rise; beginning of major embayment of Susquehanna River to form Chesapeake Bay and embayment of mouths of tributaries (including Potomac); mixed coniferous/hardwood forest-hemlock, birch, beech, with increase in oak and hickory at end of period; reduction in non-arboreal floral zones
10,500 BP	Late Glacial climate; colder and wetter than modern, particularly wetter during winter; reduced sea level; coastal plain rivers in narrow channels draining into Susquehanna River/early Chesapeake Bay; mosaic of floral zones--arboreal and non-arboreal; trees are spruce and pine; non-arboreal species are grasses, sedges, heliophytes, hydrophytes.

Vegetation at the opening of this period would have consisted of a mosaic pattern which followed both vertical and horizontal zonation. The dominant mosaics would have consisted of patches of conifers scattered throughout the level well-drained uplands surrounded by broad areas of open grasslands; in effect, a parkland. Less well drained areas would have also supported a vertically zoned deciduous growth in linear strips with oaks and hickories growing along the bluffs and slopes and sycamore, willow and cottonwood in the valley floors. This is essentially the scenario for the HDLA facility.

Faunal associations would have consisted of a mix of extinct and extant forms. The evidence now indicates that most of the now extinct fauna was well on its way to absolute reduction by the opening of this period. There may well have been some reduced herds of grazers such as mammoth, horse and caribou in the open areas, but the paleontological evidence suggests that most of these forms were gone by 15,000-13,000 BP. A more likely candidate for survival at this late date is the mastodon, a browser in the coniferous forested area. Deer and elk, and possibly moose, would have been relatively abundant. Current theory has deer increasing in considerable abundance along the extensive edge and in the face of reduced competition created by the terminal Pleistocene extinctions.

Toward the end of the Late Glacial, the trend was toward a decrease in percent of pine, and an increase in the oak element, as mean annual temperature gradually rose. Man is presumed to have arrived on the scene in the general area between 11,500-11,000 BP. Conditions would have been optimal for populations with a hunting strategy supplemented by general foraging.

Early Post-Glacial (10,500-8500 BP). The continued warming and drying trend resulted in the spread of deciduous elements at the expense of the northern conifers. Overall, the openness of the previous forests moved toward closure, but considerable expanses of land remained unforested and extensive edges were still present. In North Carolina, the evidence indicates that seasonality in the climate as we know it now had begun by 9000 BP. Essentially modern faunal assemblages appear by at least 9300 BP, probably earlier. The edge, however, favored a high density of edge adapted browsers such as deer and elk. The rise in sea level continued and by the close of the period, the Anacostia Potomac system was probably a ponded fresh-water estuary, although still well beyond the tidal limits, and at a depth considerably below present. Meandering and aggradation would have begun on streams such as Paint Branch.

The conditions still favored subsistence pursuits which emphasized hunting. A decline in edge toward the end of this period would have tended to emphasize the general foraging aspect. Major stream systems probably provided a focus for fishing. Evidence from a number of areas in the Coastal Plain indicate the increase in the number of migratory waterfowl.

Mid Post-Glacial (8500-3500 BP). The trends observed during the last period continued as temperatures continued to warm and deciduous elements

peaked in different climaxes. Precipitation rates fluctuated markedly during this era, a phenomenon which has resulted in the division of the Mid Post-Glacial into two sub-periods. During the earlier portion, the Atlantic episode occurring between 8500-6000 BP, the overall cast is that of increased precipitation. It is also at this juncture that numerous fluvial and upland swamps form in the Coastal Plain. Exactly what was happening on the immediately adjacent Piedmont tributaries is not known. It is likely, however, that similar swamps were being formed, although the increased moisture may have resulted in channel cutting on some streams (this situation simply has too many variables for facile characterization).

The second phase of the Mid Post-Glacial has been labeled the Sub-Boreal with a marked increase in temperature, at least 2°F higher than the present mean, and a increased evaporation rate. If the paleo-environmentalists are not beguiled by the increased evaporation, this also seems to be a period of reduced precipitation. The temporal span of this era is from 6000-3500 BP. This is also the time of the Late Holocene Xerothermic, the hottest and driest period observed in the paleo-environmental record since the beginning of the last Wisconsin some 35,000 years ago.

The net effect of this on the terrestrial environment was forest closure with an oak-hickory maximum. Sea level rise slowed considerably. Tidal limits probably had reached the Georgetown area on the Potomac and Prince Georges County on the Anacostia. Archeological evidence points to a rise in the presence of anadromous fish and it can be inferred that the rivers seasonally teemed with spring runs of various types of fish. Optimal general foraging strategies would have shifted from a generalized seasonal round of river, inter-riverine exploitation, to an increased focus on the major river and stream systems.

A significant vegetation at this juncture (by 3500 BP) was the appearance of many southern species, especially southern types of pine and cypress and bay trees. The oak-pine-hickory forest was likely present in the Coastal Plain at this juncture.

Late Post-Glacial (3500 BP-present). Sea level rise continued, but at a much decelerated rate. Salinity of a high enough count to support oysters along the Potomac in southern Charles County was present by 3000-2750 BP. It can be assumed that the slightly brackish condition of the Anacostia was established. However, since there was considerable fluctuation in precipitation, this can be assumed to have also varied considerably depending on the amount of fresh water being pumped into the tidal tributaries. A hallmark of the latter part of this period is the Little Ice Age of between 600-300 BP. This was a relatively long-lived cool and dry period which favored the establishment of extensive open areas and a concomitant rise in the deer population. By now, agriculture was being practiced by the prehistoric populations, but the archeological evidence also shows an increase in inter-riverine hunting at this time. The new open forest also allowed for the eastern expansion of the bison, a herd of which were spotted by Captain John Smith on the western Maryland shore of the Chesapeake Bay.

2.2 THE CULTURAL ENVIRONMENT

This section presents a summary of the prehistory of the general area in which HDLA is located (Table 2-2). It is drawn from a variety of sources. The synthesis from which this section is taken is from a volume on Middle Atlantic prehistory by Gardner and Carbone (n.d.). Like the previous section on the paleo-environment, an attempt is made to keep the reconstruction applicable to HDLA, but no primary data are available from the facility itself.

2.2.1 Prehistory

Paleo-Indian (9500-7500 BC). There is considerable debate about whether this is the earliest culture period in North American prehistory. There is, however, little debate about this being the earliest cultural period in the Middle Atlantic. In the general area three phases based principally on changes in projectile point morphology can be recognized. These are Clovis, Mid-Paleo, and Dalton. All three phases are recognized in Maryland (Brown 1979). As far as can be determined from the available evidence, the tool kit, consisting of a variety of tools such as unifacial scrapers, wedges, burins, graters, and knives, as well as bifacial projectile points and knives, remains unchanged throughout all three phases. While manufacturing techniques vary, the basic technology is a core reduction and flake tool tradition.

One of the hallmarks of the Paleo-Indian cultural pattern in the Middle Atlantic is a focus on specific types of cryptocrystalline materials; including a variety of chert, jasper, and chalcedony. Alternative lithic choices were employed when experience dictated, although exploitive rounds were designed to minimize the necessity for alternative choices. Since lithic choice appears to be embedded in the system, location and categorization of sites with reference to such material has proved an effective analytic and predictive tool. To date, five types of sites are recognized: quarries, lithic reduction stations, quarries associated base camps, base camp maintenance stations, and hunting camps. A sixth category is not a site per se but consists of Paleo-Indian (fluted) point finds. All except the hunting sites and point finds are locationally dependent on lithic deposit locations as well as other variables such as water, nearby high biomass habitats, aspect, level topography, and drainage. Hunting sites and point finds are also dependent on the location of the desired types of lithics in that they tend to define the overall exploitive area, and such sites and finds decrease or increase in relationship to their distance from quarries. Of more specific predictive value is the distribution of Late Pleistocene tributary junctions and/or fluvial swamps, and nearby level well drained alluvial features such as terraces and fans. Given the fact that these are relatively ubiquitous, their predictive value is limited, except when they are considered with reference to the quarry exploitive area, the overall environment of the particular physiographic province, and major drainage systems. With reference to this latter, the location of highest probability is at or near the junction of streams third order and above.

Table 2-2. A SUMMARY OF THE CULTURAL CHRONOLOGY OF THE AREA OF THE HARRY DIAMOND LABORATORIES - ADELPHI, MARYLAND

Cultural Unit		Kinds of Archeological Remains Representative of Period		
Tradition	Period or Phase	Date	General Settlement Patterns	General Subsistence Systems
American	Commercial	AD 1920 to present	Rural small farms with large market foci (Baltimore and Washington), more suburban residence related to Washington, D.C.	Agriculture, tied to regional and national markets; light industry, often service oriented; national government employment.
	Post Civil War/Industrial	AD 1865 to 1920	Small farms with local focus; some small, locally focused industry; surplus traded to regional markets (Washington and Baltimore).	Agriculture; small service industry; trade by railroads.
	Pre Civil War/Early Industrial	AD 1820 to 1865	Small farms with local focus; Some large farms; tenant farming, use of slaves.	Agriculture; small local industry; trade by water transport and roads.
	Post Revolution	AD 1781 to 1820	Mixed large farms and small farms/tenant farms; local focus; some use of slaves.	Agriculture, subsistence and market/cash cropping.
Colonial	Late Colonial Semisubsistence	AD 1700 to 1820s	Mixed large and small landholdings; tenant farms; some use of slaves, especially on large farms; tobacco as cash crop (external trade to England); otherwise, local focus.	Foundations and house outlines of large and small frame structures; outbuildings; slave quarters; wells, privies, trash pits; tobacco pipes; ceramics-pearlware, some creamware, salt-glazed stoneware.
	Early Colonial/Late Contact	AD 1600 to 1700	European; isolated large landholdings; tenant farms. Aboriginal: major population depletion due to disease; massive shifts in population; dislocation, fragmentation.	Farm sites, foundations and house outlines of frame structures; wells, privies, trash pits; tobacco pipes; ceramics-lead glazed red-bodied earthenwares, slipwares, tin glazed earthenwares, stoneware. Triangular and metal points; metal trade goods-axes and kettles; glass beads; European flint.

Table 2-2. A SUMMARY OF THE CULTURAL CHRONOLOGY OF THE AREA OF THE HARRY DIAMOND LABORATORIES - ADELPHI, MARYLAND (Continued)

Cultural Unit				Kinds of Archeological Remains Representative of Period	
Tradition	Period or Phase	Date	General Settlement Patterns	General Subsistence Systems	
Woodland	Discovery and Exploration/Early Contact	AD 1550 to 1600	European: camps, trading posts. Aboriginal: shifts in population due to trade; increased nucleation of settlements; increased warfare.	Sponsored exploration. Horticulture/agriculture; trade of furs to international markets; regional trade of European goods.	Small sites; metal and glass trade goods; tobacco pipes. Triangular points; shell tempered pottery; European trade goods including glass beads, metal items; European flint; palisaded villages.
	Late Woodland	AD 1000 to ca 1550	Larger sites, palisaded in later part; long term settlement/villages in areas near agricultural land and estuary resources; smaller inland sites (hunting?).	Maize horticulture/agriculture; hunting and gathering to supplement; shellfish and fish along rivers and estuaries.	Village sites (some palisaded); camp sites; ossuaries; ceramics-Potomac Creek, Rappahannock. Townsend Series, Potomac Creek, Keyser/Page, Radford; small triangular points.
	Middle Woodland	500 BC to AD 1000	Camp sites near riverine/marine resources, especially near embayed estuaries of small streams and rivers; small upland sites.	Hunting, and gathering; probably horticulture; shellfish and fish at river/estuary sites.	Shell middens; camp sites; small upland sites; ceramics-Popes Creek, Albemarle, Mockley; points-Vernon, Calvert, Claggett, Selby Bay.
Archaic	Early Woodland	1000 BC to 500 BC	Camp sites near riverine/marine resources, especially near embayed estuaries of streams and rivers; small upland sites.	Hunting and gathering; seasonal resources; shellfish and fish at river/estuary sites.	Shell middens; camp sites; small upland sites; ceramics-Marcey Creek, Selden Island, Accokeek; points-Roseville, corner and side notched variants.
	Late Archaic (or Transitional)	2500 BC to 1000 BC	Larger riverine/marine camp sites, especially at embayed estuaries of streams and rivers; smaller upland camps.	Hunting and gathering; riverine focus--shellfish and fish; gathering includes hickory nuts and acorns.	Shell middens; camp sites; smaller upland sites; points-broadspear variants, fishtail points; steatite bowls late in phase.
	Middle Archaic	6500 BC to 2500 BC	Many widely distributed small sites in most environmental zones; no quarry sites, no emphasis on quality of lithic raw material; many limited activity sites keyed to seasonally available resources.	Hunting and gathering; emphasis on gathering/foraging, especially vegetal foods (acorns and nuts).	Small camp sites; points-bifurcates (LeCroy, St. Albans, Kanawha), stemmed (Stanly, Morrow Mt., Guilford), side notched (Hallifax); ground stone tools.
Early Archaic	Early Archaic	8000 BC to 6500 BC	Expansion into more areas than Paleo-Indian, but still large camps near lithic sources; less reliance on lithic material and more emphasis on seasonally available resources.	Hunting and gathering; shift to more foraging, especially seasonally available resources.	Small camp sites; some large sites near desired resources; points-corner and side notched (Palmer, Kirk).

Table 2-2. A SUMMARY OF THE CULTURAL CHRONOLOGY OF THE AREA OF THE HARRY DIAMOND LABORATORIES - ADELPHI, MARYLAND (Continued)

Cultural Unit		Period or Phase	Date	General Settlement Patterns	General Subsistence Systems	Kinds of Archeological Remains Representative of Period	
Tradition							
Paleo-Indian Late or Dalton			7500 BC to 8000 BC	Fewer sites; large sites related to lithic procurement areas; hunting camps.	Hunting and gathering.	Quarry sites, stone tool manufacturing sites; small hunting sites; points-Dalton, Dalton/Hardaway.	
	Middle Paleo		8500 BC to 8000 BC	Few sites; related to lithic procurement; small hunting sites.	Hunting and gathering.	Quarry sites, stone tool manufacturing sites; small hunting sites; points-middle Paleo (small fluted point).	
Clovis			9500 BC to 8500 BC	Large camps related to lithic procurement areas; quarry sites at sources of cryptocrystalline rocks; hunting sites.	Hunting and gathering; apparent emphasis on hunting technology.	Quarry sites, stone tool manufacturing sites; base camps near sources of lithics; small hunting/extraction sites; point-Clovis type.	

Within the Virginia-Maryland area, the known base camps are in the Ridge and Valley, the Potomac River edge of the Piedmont-Blue Ridge interface, and the Virginia Piedmont below the James River. High density point finds are reported for the Piedmont-Coastal Plain interface in northeastern Maryland and western Delaware near primary outcrops of Cecil County black chert and Iron Hill jasper. Similar finds are also reported for the Eastern Shore of Maryland, in an extensive area opposite the mouth of the Potomac. These latter are associated with cobble beds loaded with a variety of cherts and jaspers deposited by the ancestral Susquehanna River.

There are no known Paleo-Indian sites in the Maryland Piedmont. There are fluted point finds. Most of these come from along the Potomac near stream junctions or on fans overlooking areas which at that time were backwater floodplain swamps. Fluted point finds decrease markedly as the Washington area is approached. No more than a half dozen fluted points are reported for the Potomac Coastal Plain. Three have been reported from the Bennings area of the Anacostia near the junction of the river with the Potomac. Perhaps two are known for all of Prince Georges County. The HDLA area is thus not the type of location in which Paleo-Indian sites, or even point finds could be anticipated.

Early Archaic (8000-6500 BC). The Early Archaic period in the Middle Atlantic is considered to be an extension and a continuation of the Paleo-Indian period. There are numerous lines of evidence to support this continuity and, in general, almost all aspects of the settlement pattern, tool kit, and relationship with a restricted range of lithic material continue. There are some exceptions. In the tool kit, there is diversification with the appearance of such items as axes and drills. The number of sites increase and are found in areas where sites of the previous period are not. In part, this reflects a population increase and, in part, increased exploitation of a diversity of niches. As would be expected from both of these changes, increasing catholicity of lithic selection becomes evident. This broadening of the lithic selectivity is apparent almost from the beginning but accelerates toward the end of the period and by 6500 BP, the end of the Early Archaic, little if any lithic preference remains. These changes are commensurate not only with the apparent population increase and territorial expansion, but can also be tied, inferentially at least, to a generalization of the subsistence base. In other words, as the hunting aspect is de-emphasized the greater the shift away from the links between the Paleo-Indian and Early Archaic.

A number of temporal phases have been delineated for the Early Archaic. Again, these are based almost exclusively on changes in projectile point styles. The most common nomenclature employs the scheme of Palmer Corner Notched, Kirk Corner Notched, Kirk Side Notched, and Kirk Stemmed with these arranged from earliest to latest.

The terminal date is around 6500 BC with the beginning date at 8000 BC. More recently, the following system has been employed: Corner Notched Horizon, Side Notched Horizon, and Stem Indented Horizon. With the changes noted above, there is continuity between all of these phases, although it must be reiterated that the end of the Early Archaic looks

more like the beginning of the next period than it does its own early manifestations.

Although the number of projectile points marking various Early Archaic phases increases in the Potomac Piedmont and Coastal Plain, the population still appears to be relatively low. The concentration of points and sites are still in the same general areas as the Paleo-Indian period. Most of the known point finds in the general area tend to come from the upper Potomac Coastal Plain in the area of Mattawoman and Zekiah Swamps in Charles County. This is seen as commensurate with the growth of fluvial swamps in this physiographic province. While little systematic analysis of the numbers and distribution of Early Archaic points has been completed, work in progress by June Evans of American University in the Patuxent and Potomac Piedmont as well as that of Maureen Kavanagh (Kavanaugh 1982) of the Maryland Geological Survey's Division of Archeology along the Monocacy River support this scenario. As it is understood now, the Piedmont sites tend to be concentrated along the major drainages with very little in the inter-riverine stream systems or adjacent uplands.

Middle Archaic (6500-2500 BC). This cultural period covers the time span from 6500 to 2500 BC. Several projectile point phases have been isolated. From earliest to latest, these are LeCroy, Stanly, Morrow Mountain, Guilford, and Halifax. In other terminology, these are Bifurcate Horizon, Stem Indented Horizon II, Contracting Stem Horizon, First Side Notched Horizon. Virtually no work has been done on delineating change within this long period at the phase level. Viewed overall, the basic adaptive strategy is one of exploitation of seasonally ripening resources in a variety of niches and habitats that saw the populations moving from the riverine areas after the early spring, into the inter-riverine uplands and smaller streams during the summer and fall and back to the rivers in the late fall or early winter. As contrasted to the Paleo-Indian and Early Archaic, this is generally viewed as a broad based, or generalized hunting and gathering economy, as opposed to the more focal economies of the earlier periods. This is acceptable as long as one views the early periods as broad based but limited by the environmental potential, their technology and traditional pursuits. Put another way, the Middle Archaic witnesses a de-emphasis of the hunting aspect and a broadening of the more generalized aspects of subsistence. Parallel with this is a generalization of the tool kit and lithic choice.

Middle Archaic sites can be located virtually anywhere. The only real key is water. Water tends to be a limiting factor and sites are rarely located more than 200-400 ft. away from some type of naturally occurring water, e.g. spring, stream, river, pond, lake, creek, swamp. Lithic material also plays a part in site choice because lithics for tool use are generally in the immediate vicinity. Given the virtually ubiquitous presence of cobbles and pebbles and quartz in the Piedmont, this is, however, hardly a useful predictive factor. Like the Paleo-Indian and Early Archaic, the range of sites includes base camps. Base camps tend to be located in especially high biomass habitats. Winter and early spring base camps are in the most dependable and productive of all natural habitats, the floodplains of the major rivers.

Other seasonal base camps can be located in any especially productive habitats such as the fluvial swamps in the Coastal Plain. These types of camps can be considered as fusion stage sites in which the largest clusters of people gathered at any particular time. This type of site is also a base camp. It is, however, in the fission stage, or that time when the larger population has broken down into varying size smaller cooperating social units. These are, as would be expected, the most numerous of the base camps. They tend to be located where water and lithics are available, where there is an immediately continuous productive habitat, and where other productive habitats are within easy access. The most numerous Middle Archaic sites are much smaller: the type of site which is usually included under the category of lithic scatter or transient camp. The best interpretation of these sites is support camps, or exploitive camps, which radiate out from the different types of base camps. In this sense, the base camps can be viewed as the staging area for these smaller, more specialized, limited occupation sites.

One of the more striking phenomena in Middle Atlantic archeology is the sudden proliferation of Middle Archaic period sites. This is true not only for total number of sites and point finds, but of the tremendous diversity of terrain in which they are found. It is obvious that this represents a marked population increase over any of the preceding periods. It is also indicative of the type of exploitive and settlement pattern employed. This is also the period in which the earliest prehistoric use of HDLA could be anticipated with the type of site being one of the transient camps.

Late Archaic (2500-1000 BC). The Late Archaic, in terms of projectile stylistic continuity, represents a sudden break with the Middle Archaic. The terminal Middle Archaic point style is a side notched form. The beginning Late Archaic form is a broad bladed, straight or slightly contracting stemmed type. Continuity of form would be better served if the Guilford style evolved directly in this broad bladed type, known as Savannah River. In other respects, there is some continuity. The terminal Middle Archaic witnesses an increasing focus on the floodplain habitat, especially in the Piedmont, and a slight reduction in the inter-riverine areas. The Late Archaic carries this to an extreme in the Piedmont and Coastal Plain with a return to a focal economy: the focus at this juncture being on the resources of the estuaries of the Coastal Plain and the Coastal Plain draining major rivers of the Piedmont. The correlation here is with the decrease in sea level, establishment of a stable estuarine environment and radiation of various estuarine and marine resources including anadromous fish, those species of most importance to the Piedmont. In addition, along the Piedmont streams there is the development of a number of backwater swamps and in the inter-riverine area, forest closure and reduction of the terrestrial upland variability and abundance. As would be expected with the move to a focal economy, the overall number of Late Archaic period sites decrease. This decrease is especially marked in those areas most removed from the major river systems. Riverine and estuarine sites, however, become larger, and perhaps even more numerous, although there is too little information to support this latter contention. Even so, the

indications are that there was no population loss, and there was probably even a gain. What the reduction in total numbers of sites indicates is a reduction in seasonal shifting and a rise in longer term stays, that in some areas, toward the end of the period, hint at the sedentism which picks up in the succeeding period.

The most widely accepted temporal marker of the Late Archaic is the point style known as the Savannah River Broadspear. This is a nearly pan-regional form that extends from central Florida along the Atlantic Coast to at least New Hampshire and inland for varying distances. Within much of the Middle Atlantic, the style extends into the Ridge and Valley province. Associated with this is the widespread, although not universal use of bowls made of the soft stone, steatite or talc. One should qualify the phrase "not universal" to signify that it may be universal in base camp settings, but does not occur at other more transient, or shorter term stay camps, a factor reflecting its lack of portability and expense in procuring and manufacturing.

Within the immediate project area, there is a subsequent division during the Late Archaic into Savannah River-evolved (or derived) styles and the Susquehanna Broadspear. This latter form evolves out of Savannah River ancestor and continues its broad blade tradition, but notching replaces the straight or slightly contracting stem. The Potomac River serves as a virtual border for these two styles in the Piedmont with Susquehanna points occurring from the Potomac north and the evolved Savannah River point to the south. Between the Coastal Plain and Piedmont, the Fall Zone serves as this border (this is a true border because the two styles literally do not overlap except in rare instances and only then in the extreme inner Coastal Plain). In the Piedmont and Coastal Plain, the early Savannah River style sees the return of a cultural preference for a restricted lithic type, at least in what is used for making the projectile point. In this case, it is quartzite. Quartzite does not occur naturally in these areas but is one of the most abundant cobbles or boulders. This preference continues as the two different stylistic traditions evolve. In Susquehanna components the switch is to rhyolite, a common stone in the Blue Ridge east of the Monocacy Valley.

Most of the Late Archaic sites are, as noted, concentrated in the riverine or estuarine setting, generally at the junction of a stream with the river or estuary, or in the Piedmont, on the islands in the river. Large base camps have been noted in a number of areas, generally in settings strategic for the exploitation of anadromous fish. Smaller satellite locations, replicating the larger sites in most respects, occur at other strategic spots. Within some minimal distance of these sites, a number of smaller upland inter-riverine sites also occur. These types of sites decrease markedly as the distance from the major rivers increase. Hunting and quarrying sites are reported in the Blue Ridge near the rhyolite outcrops for Susquehanna components. Small, Savannah River related components can be anticipated for HDLA.

Early Woodland (1000-500 BC). Early Woodland in the area of HDLA is technologically characterized by the appearance of ceramics, which replace and are made in the form of their precursor, stone bowls. The earliest ceramic type is known as Marcey Creek and is dated at 1000 BC, the beginning of the Early Woodland. Successive styles are known as Seldon Island and Accokeek, both of which have cord impressed exteriors as opposed to the plain exterior of Marcey Creek. The Seldon Island type also sees the introduction of the annular ring or coiling technique in pottery manufacture and the conoidal base. These latter two characteristics, along with some form of textile impression on the exterior vessel walls, mark aboriginal ceramics until the loss of indigenous technology in the historic period. While pottery is significant as a temporal marker, it is even more significant as an indicator of the sedentary way of life which is also a hallmark of the Early Woodland. While the later pattern of corn, beans, and squash agriculture is not known to be present at this period, it is suspected that manipulation of local plant resources in a fashion approaching horticulture was probably developed as a supplement to the previously existing fishing and general foraging pattern to enable a sedentary way of life to come into being. There were probably also advances in storage technology as well as increased social emphasis on the generation of surpluses.

Although the information is rather limited, there is little to support any suggestion of a population increase. Site sizes tend to remain the same, and there seems to be no real increase in the number of sites, satellite or otherwise. The stylistic boundaries evidenced in the latter part of the Late Archaic continue in the projectile point types with side notched forms generally known as "fish tails" evolving out of the Susquehanna type, and smaller stemmed types known as Vernon developing out of the evolved Savannah River style. The ceramic styles do not respect these boundaries as the types cross-cut all provinces, probably reflecting the rapid adoption of technology and style of this apparently valued innovation. As will be noted, ceramic boundaries do subsequently develop.

Although sedentism in a hamlet, or clusters of small numbers of dwellings, becomes the way of life at this time, the outlying support sites continue because aboriginal subsistence was never productive enough to do away with these types of sites. If sites of this era occur on HDLA, they will be of this type and recognizable as lithic scatters with perhaps a ceramic sherd or two.

Middle Woodland (500 BC-AD 1000). There is little change locally over the preceding period which is currently seen as ending around 500 BC. Elsewhere in the Middle Atlantic, extensive trade systems, elaborate funeral complexes, and low level ranked societies evolve. In the outer Piedmont and inner Coastal Plain, none of this has been reported. The major changes are in the ceramic styles as pottery with net marked exteriors appears in the Coastal Plain and net marking as well as cordmarking occurs in the Piedmont. The Piedmont types are known as Albemarle Cordmarked and Net Impressed, while the Coastal Plain type is referred to as Popes Creek Net Marked. This suggests a trend toward the

ceramic stylistic divergence of the next period. The projectile point divergence apparently continues with a contracting stem form known as Rossville (or Rossville-like) marking the Piedmont and a small side notched type known as Calvert characteristic of the Coastal Plain.

Site size and location continue to be virtually identical. The same sets of support sites also continue to occur. Again, these latter are all that would be anticipated in the HDLA facility grounds.

The beginning of the second phase of the Middle Woodland occurs around AD 200. At this juncture, there is marked ceramic stylistic divergence between the Coastal Plain and the Piedmont. In the Coastal Plain, shell tempering replaces the previous sand tempering tradition which began with Accokeek and continued through Popes Creek. This new pottery has both net impressed and cordmarked surfaces and goes under the name of Mockley Ware. The Albemarle tradition continues much as before in the Piedmont. Little is known about projectile point styles in the Piedmont. The point form in the Coastal Plain associated with the shell tempered pottery is known as Selby Bay. Increased trade is seen in the Coastal Plain of the immediate general area. This is, however, not accompanied by the societal ranking and elaborate burial systems of the earlier Middle Woodland.

Late Woodland (AD 1000-ca 1550). The Middle Woodland terminates around AD 900. With the beginning of the Late Woodland several major changes occur. The first is a change in site location. High biomass areas are still preferred and local sources of fresh water are paramount in site selection. The major variable, however, becomes locations adjacent to extensive tracts of arable and easily tilled land. This is almost universally in the floodplain setting. The indication is that corn, beans, and squash agriculture have become a major component of the subsistence system at this time. Site size remains the same and the hunting and gathering satellite sites continue to be used.

Pottery in the Coastal Plain continues in the shell tempered tradition with fabric impressed exteriors replacing all other forms. Decorative embellishment of pottery, of which only minor efforts were made in earlier periods, becomes more common. The initial decoration is applied with a cord wrapped stick which is impressed in the wet surface of the clay. This ceramic series is known as Townsend/Rappahannock. In the Piedmont, the Albemarle tradition evolves into what is known as the Montgomery Focus with its associated Shephard ware. In this series, cordmarked surfaces predominate. Strips of clay, or pseudo-collars, are added to the rim-lip of the vessels. By around AD 1300, this tradition expands into the Potomac Coastal Plain replacing the Townsend/Rappahannock series. After this, there is continued expansion of the tradition along the Western Shore of the Chesapeake Bay and as far south as the Rappahannock River. The evolved Shephard ware, now known as the Potomac Creek series, becomes embellished with cord wrapped stick stamping over a portion of the vessel body. The Townsend/Rappahannock series evolves east of the Bay and south of the Rappahannock River into incised decorated types. This is associated with most of the Algonquian speaking groups of the southeastern Virginia area and the Eastern Shore.

The Potomac Creek series is associated with the historic Piscataway, Conoy, and Patuxent.

Sometime just before the arrival of the Europeans, or just after the fur trade had begun in the mid-sixteenth century, inter-Indian rivalries led to the coalescence of hamlets into villages with nearby individual farmsteads. Many of these villages, particularly those on frontier areas, become stockaded.

The only point style employed during the Late Woodland, and a marker type for the period, is the triangular point. This style is assumed to be associated with wide spread use of the bow and arrow.

Late Woodland transient or small exploitative camps can be anticipated for HDLA, but in the absence of temporal diagnostics would be difficult to segregate from similar types of sites of earlier periods.

2.2.2 Ethnohistory

The following overview is drawn primarily from Feest (1978a, 1978b, 1978c) and Gardner and Carbone (n.d.).

The earliest contacts with Middle Atlantic Indians are assumed to have been by the Spanish sometime in the first half of the sixteenth century. This was followed by an attempt to establish a mission on the lower Chesapeake Bay in 1570, a venture which lasted less than a year due to the unfriendliness of the Indians. This was followed by the almost equally short-lived Roanoke colony in coastal North Carolina in 1585. The subsequent English venture at colonization, the Jamestown colony in 1607, proved to be a success and established the beachhead for all subsequent English colonization. Captain John Smith sailed to the head of the Chesapeake Bay and the Little Falls area of the Potomac in 1608-1609, where he encountered Indians already in possession of trade goods. The groups at the head of the Bay were the Susquehannocks while those along the tidal limits of the Potomac were, presumably, the Piscataway (or Conoy as they are also known). The Susquehannocks seem to be in control of the trade, or at the minimum, effective middlemen, and had apparently begun participating in the burgeoning fur trade with the French (and, probably, Dutch) shortly after 1550, the general period when the fur trade began to accelerate and the Susquehannocks shifted their base from the upper reaches of the Susquehanna River to its lower course. The Susquehannocks proved to be the most powerful force in the subsequent history of the area, yielding their suzerainty to the League of the Iroquois only after their defeat in Bacon's Rebellion in 1675-1676.

The Indians who resided in the Upper Potomac Coastal Plain consisted of a number of village centered groups grouped under the general rubric, Piscataway (or Conoy, their Iroquoian name). They all spoke a dialect of Coastal Algonquian with their closest linguistic kinsmen being the Nanticoke and Choptank of the Eastern Shore of Maryland. Through linkage with the Potomac Creek ceramic series, they are estimated to have resided in the area of their historic homeland since at least the fourteenth century. At the time of the contact and during much of the early

colonial history of Maryland, they were all grouped under a larger political entity known as a confederacy. This is probably a misnomer because the structure was that of a ranked chiefdom with hereditary power lying in a single central authority. The extent of the Piscataway confederacy is unknown, but is apparently covered much of the area between the Upper Machadoac Creek to the Fall Zone, and east through current Prince Georges and Charles counties, Maryland. The Piscataway confederacy was one of many minor chiefdoms or "mini-states" in the Virginia-Maryland tidewater with the largest and most well known being the Powhatan Confederacy.

The settlement system consisted of towns, or villages, some of which were stockaded, located on the major tributaries just upstream from their junction with the Potomac. These communities were agricultural with the basic crops being supplemented by general foraging. At various locations were smaller clusters of dwellings and individual farmsteads connected to each other and the central village by a series of paths. The basic allegiance was to the village, neighboring villages, and the confederacy.

As far as is known, there were no Indians living in the Potomac Piedmont above the Fall Line at the time of contact. It is inferred that this area was under the control of the Susquehannocks and any Indians who might have been living there up until the beginning of the seventeenth century were displaced by this powerful group, who then used the area for hunting and trapping. Others, suggest the Iroquois may have also been involved. There is some suggestion that Central Algonquian speakers ("macro-Shawnee") may have lived on the Potomac as far south as the Monocacy River, but this is likely never to be confirmed.

The Piscataway Indians suffered the same fate, with some variations, of all the other Indians in the Middle Atlantic during the early historic period. The first disaster came from other Indians, in particular, the Susquehannocks. This was followed by rapid population loss as the result of diseases introduced by the Europeans. Throughout the history of their relationship with the Maryland colony, the Piscataway were alternately at peace and at war. With the upriver and westward spread of the colonists, the Piscataway were soon subject to pressures for their land. A series of treaties followed. With the signing of a treaty between the Susquehannocks and the Marylanders, the final fate of the Piscataway was sealed. Just before 1700 and in the decade thereafter, they began moving out of the area, settling first on the islands in the Potomac Piedmont, finally moving north into Pennsylvania. A number remained in the area, ultimately becoming wage workers and farm hands for the Maryland plantations. The descendants of this group remain in the Prince Georges and Charles county areas today.

2.2.3 History

Captain John Smith was the first European to venture up the Potomac to the Fall Line area in the immediate vicinity of current Washington, D.C. He was followed by various English traders some two decades later with Henry Fleet being the most noted. In 1634, the Maryland colony was established in St. Marys County on the Maryland side of the Potomac near

its mouth. In 1639, Father John White established a Jesuit mission in the heart of the Piscataway area near Port Tobacco. The missionaries themselves extended their endeavors up the river to the Anacostia area.

After the end of the Jesuit endeavors, congruent with Puritan ascendancy in England, English settlement was rather rapid along the Potomac side of the western Maryland peninsula. These were generally small landholdings granted to individuals whose indentureship had expired. Conflict with the Indians of the area was considerable. After the defeat of the Powhatan Confederacy in 1644, the Virginia side was open to settlements as the Indians on that shore were no longer a threat and large landholdings in the traditional Virginia plantation system were established as far north as Mount Vernon by 1674. A grant covering much of the river portion of Prince Georges, Charles and Calvert Counties had been given earlier to William Calvert, but the grant was still in Indian territory. Interspersed among the Piscataway within this grant were various small landholdings being actively worked by Marylanders.

In 1674, the Susquehannocks moved from the Susquehanna River and settled in the midst of this. Considerable friction and outright warfare between the settlers and Piscataways, and the Susquehannocks soon followed. The defeat of the Susquehannocks during Bacon's Rebellion left the severely weakened Piscataway as the guardian of the frontier. This resulted in raids by the Senecas. In 1699, the Piscataways removed themselves from the area, thus completely opening the Maryland side of the Potomac Coastal Plain to settlement.

Prince Georges County was established in 1696 (Hienton 1972), the eleventh such governmental unit in Maryland. Created from land originally in Calvert and Charles counties, the initial boundaries included the territory between the Potomac and Patuxent Rivers, north of Mattawoman and Swansons Creek, north to the Pennsylvania line, a region encompassing much of the present District of Columbia, the northwest part of Carroll County, and all of Montgomery, Frederick, Washington, Allegany, and Garrett Counties. The county assumed most of its present form in 1748 when Frederick County was created. The final boundary change came in 1791 with the creation of the District of Columbia. Montgomery County was formed from Frederick in 1776. It was opened to settlement in 1730 and was part of an original grant to Lord Baltimore (Montgomery County Soil Survey 1960).

The initial concern of the new Prince Georges County was the establishment of tax units known as hundreds. Since the initial population was low, 1600-1700 people, there were few of these units. The project area appears to have been included in the Rock Creek Hundred. As population increased, the Potomac and Eastern Branch Hundreds were established, a division which became necessary by 1722. Throughout the eighteenth century, population continued to grow and further divisions followed.

The first county seat was Charlestown, a port on the Patuxent River in the northeastern corner of the Calvert grant (the town was also known for a while as Mt. Calvert). The seat was established between 1683-93.

In addition to being the governmental center of the new county, Charlestown was designed as a port to move goods out of the newly settled parts of Prince Georges County. Subsequently, the town of Marlborough, on the Western Branch (Patuxent), became the county seat as its trade eclipsed that of Charlestown. The county seat today is Upper Marlboro. The most important port town in terms of variety and volume of commodities shipped during the eighteenth century was Bladensburg on the Anacostia. All of these ports ultimately became landlocked as the rivers on which they were located became silted in.

Tobacco was the most important crop grown in Prince Georges County. It continues to be cultivated in the coastal plain portions of the county, but agricultural techniques developed in the Coastal Plain and transferred to the Piedmont soon destroyed the fragile Piedmont soils through overcropping and erosion. Large plantations in the Piedmont were forced to shift to multiple cropping, especially after the Revolution. Mills became common along fast flowing Piedmont-Coastal Plain interface streams. Nearby Rock Creek, for instance, has over 80 recorded grist mills. Small clusters of dwellings and stores spring up in the eighteenth century and served as market, service, and distribution centers for the surrounding agricultural population. Hyattsville was one of the more significant of these. The area, however, was never densely populated during the eighteenth and nineteenth centuries. With the establishment of land grant colleges during the latter part of the nineteenth century, College Park became the location of the University of Maryland. A sizeable research complex, especially related to agriculture, grew up around the university complex.

The role of Washington, D.C., in the area grew increasingly important during the late nineteenth and early twentieth centuries. The area, however, remained generally insular, agricultural and small town centered. This aspect did not change dramatically until World War II with the growth of the federal government and the rapid population increase in the District of Columbia. This continued to accelerate after World War II and Prince Georges County in the area immediately contiguous with Washington became increasingly a commuter community. The suburbs closest to the northeastern, eastern, and southeastern fringes of the District grew most rapidly. Washington itself had long been a mecca for free Black Americans. After the Civil War and during the Black American rural to urban migration of World War II, the inner city became increasingly Black American. This caused an exodus of White Americans to the suburbs and another growth in population in the area surrounding the city. Housing developments continued to expand and grow, accelerated even more by the desegregation laws of the 1950s and 1960s.

Single family dwellings have generally been the norm, but apartment complexes for the less affluent and more highly transient have always been a factor. These have increased as real estate economics changed and population continued to grow in concert with the federal government complex. The apartment complexes were initially on the Prince Georges-District of Columbia margins, but now have spread throughout the county. Construction of the Beltway, the metropolitan area circumferential highway, accelerated development even further out during

the 1960s and 1970s. Increasingly government offices were moved out into the suburbs, and following these were various government service related businesses and research complexes. Today, there is a hodge-podge of government service complexes, light industry, service industry, isolated stores, and numerous shopping centers interspersed throughout clusters of single family homes and apartment complexes. Agriculture is still practiced in the parts of Prince Georges County most remote from the District of Columbia borders, but is becoming an increasingly less viable economic pursuit as taxes and land prices continue to rise.

2.3 ARCHEOLOGICAL RESEARCH DIRECTIONS

2.3.1 Regional Concerns

The Maryland Historical Trust is currently developing a preservation plan for cultural resources in the state (Weisman 1982). The outline calls for the development of an overview of cultural resources, an assessment of current knowledge and research needs, the definition of study organization and research orientation, and descriptive guidelines. The outline specifies geographic areas and prehistoric and historic periods. It further suggests a series of research themes for prehistoric and historic periods. The elements of this outline can be nested hierarchically by region, period, theme, resource type and site type. The primary interest in the archeology of the HDLA facility would relate to distributional studies of settlement in the prehistoric periods and economy in the historic periods. While it is anticipated that there would be some redundancy in any sites which might be on the facility, the facility itself is located in a highly developed suburban area in which most all other archeological sites have likely been destroyed. The information which could be gained from a survey of the facility, while not expected to be highly productive in terms of site numbers or size, would nevertheless contribute to the overall aims of Maryland archeology.

More specifically, the project area falls within the Piedmont study area near the boundary with the Western Shore study area, so that the cultural adaptation associated with this geographic transition zone could provide several potential avenues of investigation. The temporal divisions of concern to the proposed state plan are Paleo-Indian, Early Archaic, Middle Archaic, Late Archaic, Early Woodland, Middle Woodland, Late Woodland, Contact and Settlement, Rural Agrarian Intensification, Agricultural-Industrial Transition, Industrial-Urban Dominance, and Modern Periods. Many of these temporal units are relatively new classifications and are not congruent with previous designations employed by Maryland archeologists.

The themes proposed for the prehistoric periods are subsistence, settlement, political, demographic, religious, technology, and environmental adaptation. Within the historic period, the following themes have been proposed: agriculture, architecture and community planning, economic, government/law, military, religion, social/educational/cultural, and transportation. Again, these are proposed themes with which not all archeologists working in Maryland would agree. It is presumed that the units of the plan will be refined

and become more meaningful and widely accepted as the state plan is completed.

The tentativeness of the plan renders it somewhat difficult to tie the proposed research directions in the HDLA area to the concrete aims of the Maryland Historic Trust. However, the broad economic theme potentially could be investigated at HDLA, specifically in the prehistoric and historic periods, particularly in the Agricultural-Industrial Transition era.

2.3.2 Installation Specific Archeological Research Directions

The HDLA facility is predominantly within the Outer Piedmont, at, or near, the Piedmont-Coastal Plain interface. It is in an upland setting, in an inter-riverine zone, on a low order tributary. Soils in the area should be severely deflated resulting in a concomitant loss of archeological site integrity but not in a total loss of information potential. In terms of productivity or attractiveness from either the prehistoric or historic perspective, the facility is not in an optimal setting. Accordingly, the types of archeological sites which can be expected are limited. Given these constraints, it would be premature to propose specific research questions until after the nature of any archeological resources can be determined through survey.

The major types of prehistoric sites anticipated are micro-social units, transient camps exhibiting generalized hunting and/or gathering activities. The earliest prehistoric components which would be expected should date from the Middle Archaic, probably post-Stanly, with possible utilization through the Late Woodland. No changes in the composition of the sites can be anticipated during this extended period. Artifact categories that can be anticipated are lithic debitage, a limited range of generalized tools, projectile points, and pot sherds. None of these are expected in large numbers. Indeed, the sites are most likely to be classified as lithic scatters with few associated temporal diagnostics. This latter would be the most limiting factor since without temporal or cultural association the value of the sites would be considerably reduced.

Unconfirmed reports about projectile points being found on the facility in the past indicate the potential for these important sets of data.

The primary historic use of the area that could be expected would relate to light industry such as mills of one kind or another and agriculture. This latter is not likely, except for use of the land as cultivated fields, for there is no reason to anticipate, nor is there any indication of, early homesteads or plantations. The water power from Paint Branch would be the major attraction for mills. There does seem to have been a mill in the immediate vicinity, but this is reported as being off the facility. The only possible archeological feature associated with the mill which might be on the facility is the race which, in and of itself, is not significant except in terms of noting its location.

AN ASSESSMENT OF ARCHEOLOGICAL RESOURCE PRESERVATION AND SURVEY ADEQUACY3.1 Environmental Constraints to Site Preservation

Harry Diamond Laboratories-Adelphi covers an area of 137 a.; the terrain is rugged with rolling hills, rock outcrops and the Paint Branch stream valley. Slopes range from 2-40 percent and are heavily forested. Erosion of the slopes is a serious problem on the installation, particularly the gullying of steep slopes.

The major environmental constraints to site preservation are the erosion and deflation which has taken place throughout the Piedmont following post 1700 deforestation and cultivation. As a result of this, virtually all of the younger soils have been lost resulting in exposure of quite old soils (in excess of 12,000 years) and any vertical separation or site integrity has been lost. In addition, there has been some horizontal movement of artifacts both through slope wash and plow drag. This does not necessarily completely reduce the value of a site since certain patterning can still be detected through systematic controlled surface collections. Most inter-riverine Piedmont sites are so small, however, that patterning can not generally be detected.

The accelerated erosion of the post-1700 period also resulted in rapid run-off of precipitation and periodic flooding of the streams. In some cases, this leads to sedimentation. Given the gradient of most Piedmont streams, it also results in channel cutting, a situation in which the streams cut back against their own valley micro-topography. This would lead to the loss of any sites which might have existed in the stream floodplains.

Other constraints can be considered more cultural as, for instance, the removal of temporal and cultural diagnostics by artifact collectors, a situation which results in the loss of the major sources of information these sites contain. All of the above are known to have occurred at HDLA.

3.2 Historic and Recent Land Use Patterns

The effects of deforestation and cultivation have been noted above. Building, parking lot construction, utility installation, and road construction in connection with the HDLA facility have also served to alter the landscape. Some relatively level bluffs overlooking Paint Branch remain intact. Archaeological sites, if present in this area, should have physical integrity (within the limitations noted in 3.1).

To better facilitate the discussion of ground disturbance, the land area within Harry Diamond Laboratories-Adelphi has been divided into 21 separate Ground Disturbance Areas (GDAs) (Figure 3-1). These GDAs will be discussed separately below (see Table 3-1).

GDA-1. This GDA includes the Aurora Facility (Building 500), the Radiation Facility (Building 504) and the Mission Equipment Storehouse (Building 505). Building 500 was constructed in 1976 (IMRP 3-31-84). To the north is an underground 10,000 gallon fuel oil tank; to the east are two aboveground tanks (MPBIM 11-21-80). Building 504 was constructed in 1976 (IMRP, 3-31-84). South of the building is an underground 3,000 gallon fuel oil tank and a 4,000 gallon waste water holding tank (MPBIM 11-21-80). Building 505 was constructed in 1984 (IMRP, 3-31-84). The acreage of this GDA is 7.5. No information was available regarding to the depth of disturbance caused by the construction related to grading and/or fill in GDA-1, though it is estimated that more than 90 percent of the area has been disturbed to an unknown depth.

GDA-2. This GDA includes five buildings: the Explosives Load and Test Facility (Building 406); two Explosives Storage Magazines (Buildings 407 and 408); the Microelectronics Facility (Building 403); and the Rate Process Laboratory (Building 404) (MPBIM 11-21-80). Building 406 was constructed in 1976 (IMRP, 3-31-84). Disturbance below the original surface totals 0-9 ft.; 0-4 ft. was graded and footings extend 5 ft. below present grade (Map 35-06-3 Plate 5, 1-31-74). West of this building is an underground 1,000 gallon fuel oil tank built in 1976, (IMRP 3-31-84). Buildings 407 and 408 were constructed in 1976 (IMRP 3-31-84). Construction required 0-2 ft. of grading (Map 35-06-3 Plate 5, 1-31-74). Building 403 was constructed in 1983 (IMRP 3-31-84). Construction required 0-7 ft. of grading (Map 35-06-44 Plate 2, 3-15-78). To the west is an underground 6,000 gallon fuel oil tank and north of the building are two aboveground chemical tanks (MPBIM 11-21-80). Building 404 was constructed in 1977 (IMRP, 3-31-84). Construction required 4-17 ft. of grading (Map 35-06-38 Plate 3, 4-8-75). Southeast of the building is a 1,000 gallon underground fuel oil tank built in 1977 (IMRP, 3-31-84). GDA-2 covers 3.1 a. More than 90 percent of the area is estimated to be disturbed to a depth of at least 3 ft.

GDA-3. This GDA is a parking lot north of North Avenue (MPBIM 11-21-80). Construction required 2-10 ft. of grading (Map 35-06-32 Plate 8, 4-25-72). There are no buildings in GDA-3, which covers 5.7 a. Over 90 percent of the area is disturbed to a depth of at least 2 ft.

GDA-4. GDA-4 contains three buildings: General Purpose Laboratory 1 (Building 202), General Purpose Laboratory 2 (Building 204) and the Administration Building (Building 205) (IMRP 3-31-84). Building 202 was built in 1974; 2-19 ft. was graded during construction (Map 35-06-3 Plate 5, 1-31-74). South of the building is an underground 500 gallon fuel oil tank (MPBIM 11-21-80). Building 204 was constructed in 1976 (IMRP 3-31-83). North of the building is an underground 500 gallon fuel oil tank (MPBIM 11-21-80). No information was available regarding the depth

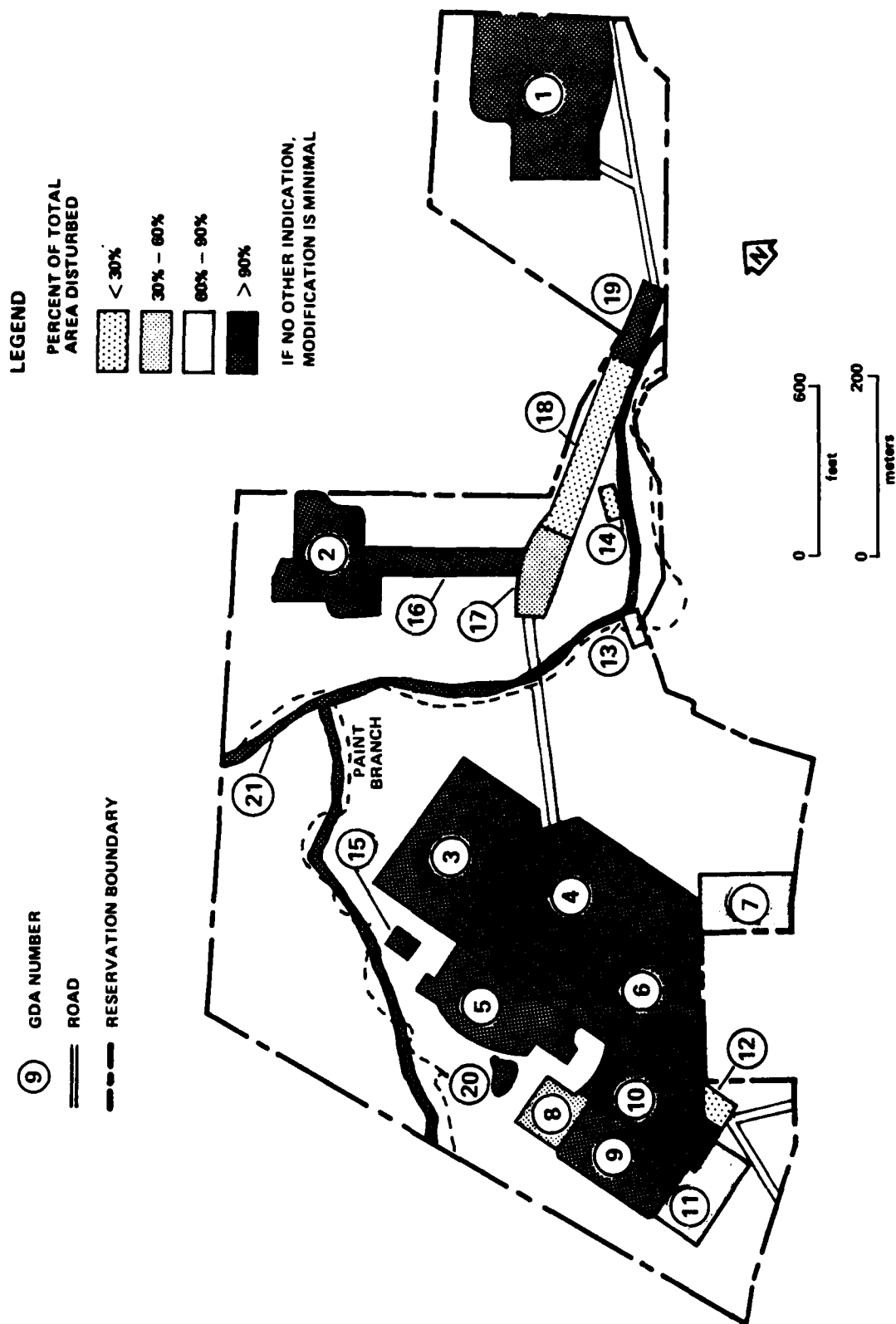


Figure 3-1. A MAP OF AREAS OF HISTORICAL AND/OR MODERN GROUND DISTURBANCE THAT MIGHT LIMIT THE PRESENT ARCHEOLOGICAL RESOURCE BASE ON THE HARRY DIAMOND LABORATORIES - ADELPHI, MARYLAND

Table 3-1. A SUMMARY OF HISTORIC AND MODERN GROUND DISTURBANCE THAT MIGHT LIMIT THE PRESENT ARCHEOLOGICAL RESOURCE BASE ON THE HARRY DIAMOND LABORATORIES - ADELPHI, MARYLAND

GDA No	Type of Disturbance	Date Constructed (yr)	Reference ^a	Area Disturbed (acres)	Estimated Depth Below Surface (ft)	Ratio of Disturbed to Total Area	Location of Disturbed Area					USGS Quad Sheet ^c	Coincidental Sites ^d
							UTMb		Legal Reference				
							Northing	Easting	Township	Range	Section		
GDA-1	Construction of: Building 500	1976	IMRP 3-31-84	7.5	?	9:10	4322250	330630	NA			B764R	
	Underground 10,000 Gallon Fuel Oil Tank		MPBIM 11-21-80		?								
	Two Aboveground Tanks		MPBIM 11-21-80	3									
	Building 504	1976	IMRP 3-31-84		?								
	Underground 3000 Gallon Fuel Oil Tank		MPBIM 11-21-80		?								
	4000 Gallon Wastewater Holding Tank	1976	IMRP 3-31-84 Basic Information Master Plan 1/82	12									
GDA-2	Construction of: Building 406	1976	IMRP 3-31-84	3.1	0-9	9:10	4322150	329950	NA			B764R	
	Underground 1000 Gallon Fuel Oil Tank	1976	IMRP 3-31-84		?								
	Building 407	1976	IMRP 3-31-84 Map 35-06-3, Plate 5 1-31-74		0-2								
	Building 408	1976	IMRP 3-31-84 Map 35-06-3, Plate 5 1/31/74		0-2								

Table 3-1. A SUMMARY OF HISTORIC AND MODERN GROUND DISTURBANCE THAT MIGHT LIMIT THE PRESENT ARCHEOLOGICAL RESOURCE BASE ON THE HARRY DIAMOND LABORATORIES - ADELPHI, MARYLAND (continued)

GDA No	Type of Disturbance	Date Constructed (yr)	Reference ^a	Area Disturbed (acres)	Estimated Depth Below Surface (ft)	Ratio of Disturbed to Total Area	Location of Disturbed Area					USGS Quad Sheet ^c	Coincidental Sited
							UTM ^b		Legal Reference				
							Northing	Easting	Township	Range	Section		
GDA-2 (cont'd)	Building 403	1983	IMRP 3-31-84 Map 35-06-44, Plate 2 3-15-78		0-7								
	Underground 6000 Gallon Fuel Oil Tank		MPBIM 11-21-80		?								
	500 Gallon Chemical Tank		MPBIM 11-21-80		?								
	1500 Gallon Chemical Tank		MPBIM 11-21-80		?								
	Building 404	1977	IMRP 3-31-84 Map 35-06-38, Plate 3 4-8-75		4-17								
	Underground 1000 Gallon Fuel Oil Tank	1977	IMRP 3-31-84		?								
GDA-3	Construction of: Parking Lot		MPBIM 11-21-80 Map 35-06-32, Plate 8 4-25-72	5.7	2-10	9:10	4321820	329800	NA			B764R	
GDA-4	Construction of: Building 202	1974	IMRP 3-31-84 Map 35-06-3, Plate 5 1/31/74	7.4	2-19	9:10	4321700	329800	NA			B764R	
	Underground 500 Gallon Fuel Oil Tank		MPBIM 11-21-80		?								
	Building 204	1976	IMRP 3-31-84		?								

Table 3-1. A SUMMARY OF HISTORIC AND MODERN GROUND DISTURBANCE THAT MIGHT LIMIT THE PRESENT ARCHEOLOGICAL RESOURCE BASE ON THE HARRY DIAMOND LABORATORIES - ADELPHI, MARYLAND (continued)

GDA No	Type of Disturbance	Date Conducted (yr)	Reference ^a	Area Disturbed (acres)	Estimated Depth Below Surface (ft)	Ratio of Disturbed to Total Area	Location of Disturbed Area				USGS Quad Sheet	Coincidental Sites
							UTM ^b	Northing	Easting	Township	Range	Section
GDA-4	Underground 500 Gallon Fuel Oil Tank		MPBIM 11-21-80	?								
	Building 205	1976	IMRP 3-31-84		0-17							
	Underground 500 Gallon Fuel Oil Tank		MPBIM 11-21-80	?								
GDA-5	Construction of: Building 203	1976	IMRP 3-31-84	3.0	?	9:10	4321700	4321700	329700	NA		B764R
	Underground 500 Gallon Fuel Oil Tank		MPBIM 11-20-80									
GDA-6	Construction of: Parking Lot		MPBIM 11-21-80 MAP 35-06-3, Plate 5 1/31/74	6.0	2-4	9:10	4321800	4321800	329820	NA		B764R
GDA-7	Construction of: Main Entrance		MPBIM 11-21-80 MAP 35-06-34, Plate 7 1-31-74 MAP 35-06-32, Plate 8 4-25-72	1.7	0-2	8:10	4321520	4321520	329950	NA		B764R
	Guard Post 200	1975	IMRP 3-31-84 MPBIM 11-21-80 MAP 35-06-34, Plate 7 1-31-74 MAP 35-06-32, Plate 8 4-25-72		0-2							
	Parking Lot		MPBIM 11-21-80 MAP 35-06-34, Plate 7 1/31/74 MAP 35-06-32, Plate 8 4-25-72		0-2							

Table 3-1. A SUMMARY OF HISTORIC AND MODERN GROUND DISTURBANCE THAT MIGHT LIMIT THE PRESENT ARCHEOLOGICAL RESOURCE BASE AT THE HARRY DIAMOND LABORATORIES - ADELPHI, MARYLAND (continued)

GDA No	Type of Disturbance	Date Conducted (yr)	Reference ^a	Area Disturbed (acres)	Estimated Depth Below Surface (ft)	Ratio of Disturbed to Total Area	Location of Disturbed Area					USGS Quad Sheet ^c	Coincidental Sited
							UTMb			Legal Reference			
							Northing	Easting	Township	Range	Section		
GDA-8	Construction of: Building 104	1976	IMRP 3-31-84 MAP 35-06-3, Plate 5 1/31/74	1.2	0-2	5:10	4321580	329650	NA			B764R	
	Underground 300 Gallon Fuel Oil Tank		MPBIM 11-21-80	?									
	Building 105	1976	IMRP 3-31-84 MAP 35-06-3, Plate 5 1/31/74		0-2								
	Parking Lot		MPBIM 11-21-80 MAP 35-06-3, Plate 5 1/31/74		0-2								
GDA-9	Construction of: Building 103	1974	IMRP 3-31-84 MAP 35-06-3, Plate 5 1/31/74	2.7	0-4	9:10	4321460	329650	NA			B764R	
	Building 102	1976	IMRP 3-31-84 MAP 35-06-3, Plate 5 1/31/74		0-4								
	Underground 500 Gallon Waste Oil Tank		MPBIM 11-21-80	?									
	Underground 5000 Gallon Gasoline Tank		MPBIM 11-21-80	?									
	Underground 300 Gallon Diesel Tank		MPBIM 11-21-80	?									
	4 Underground 20,000 Gallon Tanks		MPBIM 11-21-80	?									

Table 3-1. A SUMMARY OF HISTORIC AND MODERN GROUND DISTURBANCE THAT MIGHT LIMIT THE PRESENT ARCHEOLOGICAL RESOURCE BASE AT THE HARRY DIAMOND LABORATORIES - ADELPHI, MARYLAND (continued)

GDA No	Type of Disturbance	Date Constructed (yr)	Reference ^a	Area Disturbed (acres)	Estimated Depth Below Surface (ft)	Ratio of Disturbed to Total Area	Location of Disturbed Area				USGS Quad Sheet ^c	Coincidental Sites ^d
							UTM ^b		Legal Reference	Township	Range	Section
							Northing	Easting				
GDA-9 (cont'd)	2 Underground Gallon Tanks		MPBIM 11-21-80		?							
GDA-10	Construction of: Building 106	1974	IMRP 3-31-84 MAP 35-06-3, Plate 5 1-31-74	2.7	10	9:10	4321480	329700	NA			B764R
	2 Underground Gallon Tanks		MPBIM 11-21-80		?							
	Building 107	1974	IMRP 3-31-84 Map 35-06-3, Plate 5 1-31-74	2	2							
	Underground 20,000 Gallon Oil Recovery Tank		MPBIM 11-21-80		?							
GDA-11	Construction of: Parking Lot		MPBIM 11-21-80 MP-35-06-3, Plate 5 1/31/74	1.7	1-2	8:10	4321360	329660	NA			B764R
	Motor Pool		MPBIM 11-21-80 MAP 35-06-3, Plate 5 1-31-74		1-2							
	Guard Post 100	1974	IMRP 3-31-84 MAP 35-06-3, Plate 5 1-31-74		1-2							
GDA-12	Construction of: Aboveground 550 Gallon Oil Storage Tank		MPBIM 11-21-80	0.3	?	3:10	4321420	329750	NA			B764R
GDA-13	Construction of: Vehicle Bridge 400	1969	IMRP 3-31-84	0.3	?	8:10	4321740	330120	NA			B764R

Table 3-1. A SUMMARY OF HISTORIC AND MODERN GROUND DISTURBANCE THAT MIGHT LIMIT THE PRESENT ARCHEOLOGICAL RESOURCE BASE AT THE HARRY DIAMOND LABORATORIES - ADELPHI, MARYLAND (continued)

GDA No	Type of Disturbance	Date Constructed (yr)	Reference ^a	Area Disturbed (acres)	Estimated Depth Below Surface (ft)	Ratio of Disturbed to Total Area	Location of Disturbed Area					USGS Quad Sheet ^c	Coincidental Sites ^d
							UTM ^b		Legal Reference				
							Northing	Easting	Township	Range	Section		
GDA-14	Construction of: Building 411	1975	IMRP 3-31-84	0.3	3	3:10	4321900	330260	NA			B764R	
GDA-15	Construction of: Underground Pump Station		MPBIM 11-21-80	0.4	?	9:10	432840	329700	NA			B764R	
	Underground 30,000 Gallon Holding Tank		MPBIM 11-21-80		?								
GDA-16	Construction of: Kuester Road	1974	MAP 35-06-34 Plate 7, 1-31-74	1.0	0-30	9:10	4322080	330100	NA			B764R	
GDA-17	Construction of: Floral Drive	1972	MAP 35-06-32 Plate 9, 4-25-72	1.2	0-18	3:10	4321920	330150	NA			B764R	
GDA-18	Construction of: Floral Drive	1972	MAP 35-06-32 Plate 9, 4-25-72	2.5	17 fill	3:10	4321940	330400	NA			B764R	
GDA-19	Construction of: Floral Drive	1972	MAP 35-06-32 Plate 9, 4-25-72	1.2	0-22	9:10	4321990	330460	NA			B764R	
GDA-20	Construction of: Retention Pond		Basic Information Master Plan 1-1982	0.4	?	9:10	4321650	329620	NA			B764R	
GDA-21	Construction of: Sewerline		Map 18-02-37 Plates 10-11, 1-15-82	3.4	?	9:10	4322050	329880	NA			B764R	

^a IMRP 3-31-84 = Inventory of Military Real Property 3-31-84
 MPBIM 11-21-80 = Master Plan, Basic Information Maps 11-21-80

^b UTM zone 18

^c B764R = USGS Topographic Map, Beltsville, 7.5, Photorevised 1979

of disturbance caused by construction of Building 204. Building 205 was constructed in 1976, requiring 0-17 ft. of grading (Map 35-06-3 Plate 5, 1-31-74). North of the building is an underground 500 gallon fuel oil tank (MPBIM 11-21-80). GDA-4 covers 7.4 a. It is estimated that 90 percent of this area is disturbed to an unknown depth.

GDA-5. This GDA includes the R&E Support Laboratory (Building 203). It was built in 1976 (IMRP 3-31-84). South of Building 203 is an underground 500 gallon fuel storage tank (MPBIM 11-21-80). GDA-5 covers 3.0 a. No information was available regarding the depth of disturbance caused by the construction related grading and/or fill, but it is estimated that over 90 percent of the area is disturbed to an unknown depth.

GDA-6. This GDA is a parking lot off South Avenue. About 2-4 ft. of earth was graded during construction (Map 35-06-3 Plate 5 1/31/74). GDA-6 covers 6.0 a. Over 90 percent of the area is disturbed to a depth of at least 2 ft.

GDA-7. This GDA includes the main entrance, Guard Post 200 and a small parking lot (MPBIM 11-21-80). All three constructions required 0-2 ft. of grading. Guard Post 200 was constructed in 1975 (IMRP 3-31-84). GDA-7 covers 1.7 a. It is estimated that 80 percent of this area is disturbed to a depth of at least 1 ft.

GDA-8. This GDA includes two buildings: the Chemical Storage Building (Building 104) and the Bottle Gas Storage Building (Building 105) (MPBIM 11-21-80). Building 104 was constructed in 1976 (IMRP 3-31-84). Construction required 0-2 ft. of grading and 0-4 ft. of fill (Map 35-06-3 Plate 5 1/31/74). Southwest of the building is an underground 300 gallon chemical recovery tank (MPBIM 11-21-80). Building 105 was constructed in 1976 (IMRP 3-31-84). Construction required 0-2 ft. of grading and 0-4 ft. of fill (Map 35-06-3 Plate 5 1/31/74). South of buildings 104 and 105 is a parking area (MPBIM 11-21-80). This area required 0-2 ft. of grading and 0-4 ft. of fill (Map 35-06-3 Plate 5 1/31/74). GDA-8 covers 1.2 a. It is estimated that 50 percent of this area is disturbed to a depth of at least 2 ft.

GDA-9. This GDA includes two buildings: the Facilities Engineer Facility (Building 103) and the Technical Logistics and Supply Center (Building 102). Building 103 was built in 1974 (IMRP 3-31-84). Construction required 0-4 ft. of grading (Map 35-06-3 Plate 5 1/31/74). Building 102 was constructed in 1976 (IMRP 3-31-84). Construction required 0-4 ft. of grading (Map 35-06-3 Plate 5 1/31/74). South of the buildings are three underground tanks: a 500 gallon waste oil tanks; a 5,000 gallon gasoline tank and a 300 gallon diesel tank. East of the buildings are four 20,000 gallon tanks and two 25,000 gallon tanks (MPBIM 11-21-80). GDA-9 covers 2.7 a. it is estimated that over 90 percent of this area is disturbed to a depth of at least 2 ft.

GDA-10. This GDA includes two buildings: the Combined Heating and Cooling Plant (Building 106) and the Electrical Sub-Station (Building

107) (MPBIM 11-21-80). Building 106 was constructed in 1974 (IMRP 3-31-84). Construction required 2-10 ft. of grading (Map 35-06-3 Plate 5 1/31/74). South of the building are two underground 6000 gallon LP tanks (MPBIM 11-21-80). Building 107 was built in 1974 (IMRP 3-31-84). Construction required 2 ft. of grading (Map 35-06-3 Plate 5 1/31/74). East of the building is an underground 20,000 gallon oil recovery tank (MPBIM 11-21-80). GDA-10 covers 2.7 a. Over 90 percent of this area is disturbed to a depth of at least 2 ft.

GDA-11. This GDA includes Guard Post 100, the Motor Pool and a parking lot (MPBIM 11-21-80). Construction of these three portions of the facility required 1-2 ft. of grading and 0-4 ft. of fill (Map 35-06-3 Plate 5 1/31/74). Guard Post 100 was built in 1974 (IMRP 11-21-80). GDA-11 covers 1.7 a. It is estimated that 80 percent of this area is disturbed to a depth of at least 1 ft.

GDA-12. This GDA includes an aboveground 550 gallon oil storage tank (MPBIM 11-21-80). This GDA covers 0.3 a. It is estimated that less than 30 percent of this area is disturbed to an unknown depth.

GDA-13. This GDA consists of a vehicle bridge (400). It was built in 1969 (IMRP 3-31-84). This GDA covers 0.3 a. It is estimated that 80 percent of this area is disturbed to an unknown depth.

GDA-14. This GDA includes the General Purpose Warehouse (Building 411). It was constructed in 1975 (IMRP 3-31-84). This GDA covers 0.4 a. It is estimated that 30 percent of this area is disturbed to a depth of 3 ft.

GDA-15. This GDA contains the underground pump station and an underground 30,000 gallon holding tank (MPBIM 11-21-80). This GDA covers 0.4 a. It is estimated that 90 percent of this area is disturbed to an unknown depth.

GDA-16. This GDA consists of the length of Kuester Road (MPBIM 11-21-80). It was constructed in 1974 and involved 0-30 ft. of grading activity (Map 35-06-34 Plate 7 1-31-74). This GDA covers 1.0 a. It is estimated that 90 percent of this area is disturbed to a depth of 2 ft.

GDA-17. This GDA contains a section of Floral Drive (MPBIM 11-21-80). It was built in 1972 and 0-18 ft. was graded (Map 35-06-32 Plate 9 4-25-72). This GDA covers 1.2 a. It is estimated that 30 percent of this area is disturbed to a depth of greater than 2 ft.

GDA-18. This GDA contains a section of Floral Drive adjacent to GDA-17 (MPBIM 11-21-80). It was built in 1972 and required 17 ft. of fill (Map 35-06-32 4-25-72). This GDA covers 2.5 a. It is estimated that less than 30 percent of this area is disturbed to an unknown depth.

GDA-19. This GDA contains a section of Floral Drive adjacent to GDA-18 (MPBIM 11-21-80). It was built in 1972 and required 0-22 ft of grading. This GDA covers 1.2 a. It is estimated that 90 percent of this area is disturbed to a depth of more than 4 ft.

GDA-20. This GDA consists of a retention pond, 0.4 a. in area. The pond was created as a storm water management measure to slow the rate of runoff from the main building area (BIMP 1-82). No information was available regarding the depth of disturbance caused by construction, but over 90 percent of the area has been disturbed.

GDA-21. This GDA consists of the Washington Suburban Sanitary Commission (WSSC) sewerline. It runs through the entire facility along the central portion of Paint Branch. It also runs west along a branch of the creek north of the main complex of buildings. WSSC maintains a 30 ft. wide easement along the line which includes about 3.4 a. (BIMP 1-82). It is estimated that 90 percent of the area is disturbed to an unknown depth.

In addition to the above mentioned GDAs are the utility lines which serve the installation. Heating and cooling, water, gas, and electric lines are placed adjacent to the roads on the facility.

The remainder of the facility for which no GDA number is assigned comprises approximately 86.3 a., or 63 percent of HDLA. Most of this area represents steep slopes and fairly rugged, wooded terrain. No specific information regarding ground disturbance is available for this residual area. It is estimated that less than 20 percent of it is disturbed to an unknown depth. Because of the topography, erosion, and nature of prehistoric and historic sites noted in Section 3.1, this general lack of disturbance does not necessarily suggest the presence of archeological remains even in relatively undisturbed areas.

3.3 Previous Cultural Resource Investigations: Coverage and Intensity

A number of prehistoric and historic archeological sites have been reported in the vicinity of the HDLA. Prehistoric artifacts (broken projectile points) have been recovered from HDLA but no sites have been identified (RSEADCOM.1/HDL/GEN.5 1981). It is not known who collected these artifacts or from what portion of the facility they were taken. Besides this information, two surveys are known to have been conducted on HDLA property (Table 3-2, 3-3; Figure 3-2).

On March 4, 1976, Bro. James McPike of the Archeological Society of Maryland and Mr. Bob Beardlsey from the Montgomery County Archeological Society were provided a tour of HDLA grounds so that they could survey for archeological remains. The men were interested in locating the remains of Mrs. Harper's Woolen Factory and any prehistoric material. No cultural material was found (DA-2496 ref #DRXDO-Fa 1976).

In 1981 a more formal survey of the Paint Branch Creek was conducted by the Potomac River Archeological Survey for the Washington Suburban Sanitation Commission. The survey area included that portion of the Paint Branch located on HDLA property. A section of what was believed to be the mill race for Mrs. Harper's Woolen Factory was identified along the northern boundary of HDLA. No sites were found on HDLA (Cissna et al. 1982).

Table 3-2. ARCHEOLOGICAL SURVEYS CONDUCTED ON THE HARRY DIAMOND LABORATORIES - ADELPHI, MARYLAND

Survey Administration			Survey Location		Survey Characteristics					Identified Archeological Resources							
SHPO Survey No.	Survey Institution	Survey Date (yr)	Survey Record Repository	Bibliographic Reference	UTMC		Legal Description			Col-lection Policy	Cura-torial Repository	Sur-vey Type	Tem-poral Coverage	Tran-sect Type, (a./Inter-val (m.) day)	Sub-sur-face Tests	Iso-lated Finds, Features	
					North-ing	East-ing	Town-ship	Range	Section								Map ^d
NNA	PRAS	1981	MIT	Cisna et al 1982	4322120 Northern end	329900	NA	B764R	1	NA	Ab Unk	PH	NA	NA	S	0	1
					432190 Southern end	330500											

Notes:

- PRAS = Potomac River Archeology Survey, Anthropology Department, American University, Washington, D.C.
- MIT = Maryland Historic Trust, Annapolis, Maryland 21401
- Universal Transverse Mercator Zone 18
- B764R = U.S.X.S. Beltsville, Maryland 7.5' quadrangle, 1964, photorevised 1979
- Collection Policy 1 = nothing collected
- Survey Type and Area Codes-- A = reconnaissance of an area; b = sampling of patches; unk = total area of survey unknown
- P = Prehistoric, H = Historic, PH = comprehensive
- Survey followed stream drainage
- S = shovel turn-overs

Table 3-3. ARCHEOLOGICALLY RELEVANT RESEARCH INVESTIGATION, EXCLUSIVE OF ARCHEOLOGICAL SURVEYS, CONDUCTED ON THE HARRY DIAMOND LABORATORIES - ADELPHI, MARYLAND

Study No.	Study Type	Study Date	Institution Agency, Firm	Principal Investigator	Bibliographic Reference	Location					USGS Quad Map ^b	Associated Archeological Resources
						UTM ^a		Legal				
						Northing	Easting	Township	Range	Section		
1	Informal recon.	1976	Archeological Society of Maryland	James McPike Robert Beardsley	NA	4322120	329900	NA			B764R	None

Notes:

- a. Universal Transverse Mercator Zone 18
- b. B764R - Beltsville, Maryland 7.5' quadrangle, 1964, photorevised 1979

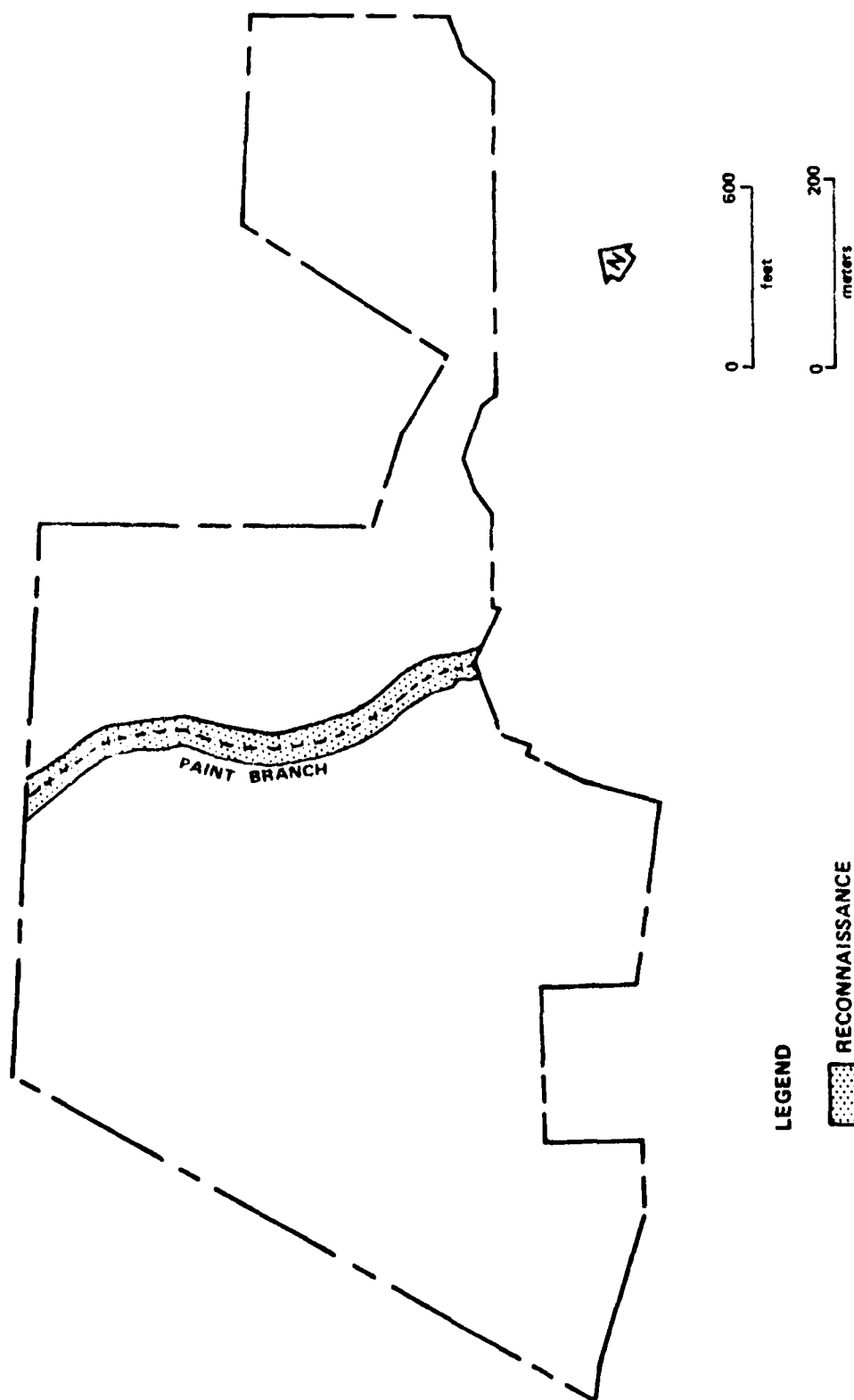


Figure 3-2. A MAP OF ARCHEOLOGICAL SURVEYS CONDUCTED ON THE HARRY DIAMOND LABORATORIES: ADELPHI, MARYLAND

3.4 Summary Assessment of Data Adequacy, Gaps

In light of the known settlement patterns of the various periods of prehistory (Section 2.2) and geographical environmental setting of HDLA it is likely that there was prehistoric occupation on the facility. The possibility of locating such sites is supported by the finds of broken projectile points on the property (RSEADCOM.1/HDL/GEN.5 1981). The types of sites are expected to be transient camps which have been severely deflated through erosion. If these sites exist, they would be found on the relatively level upland areas bordering the drainages and not in the floodplain. The floodplain is probably too young and too heavily scoured from flooding and periodic channel cutting to serve as the location of archeological sites. This explains why no sites were found during the floodplain surveys for WSSC. The sites would most likely date between 6500 BP and 500 BP (Middle Archaic-post Stanley to Late Woodland). Historic sites, except for the mill race, are not anticipated.

4.0

KNOWN ARCHEOLOGICAL RESOURCES ON THE HARRY DIAMOND LABORATORIES -
ADELPHI, MARYLAND

4.1 KNOWN ARCHEOLOGICAL SITES ON THE HARRY DIAMOND LABORATORIES -
ADELPHI, MARYLAND

One archeological site is known to exist within the boundaries of Harry Diamond Laboratories - Adelphi, Maryland. This site was identified as the remains of a millrace. Potentially associated with this millrace are the remains of the structure and associated features of the mill. In addition to the remains of the millrace, isolated prehistoric projectile point finds have been reported from the property (Table 4-1, 4-2, 4-3).

4.2 POTENTIAL ARCHEOLOGICAL RESOURCES

The physiographic setting at HDLA indicates that unrecorded prehistoric archeological sites may be present, though these are likely to be low density lithic scatters for which the primary interest would be location and information on use and diagnostics for temporal assessment. While it is possible that historic sites dating from early as the colonial period may exist at HDLA, it is unlikely that remains are present outside the associations of the aforementioned millrace (Table 4-4).

Table 4-1. PRESENTLY IDENTIFIED ARCHEOLOGICAL RESOURCES ON THE HARRY DIAMOND LABORATORIES - ADELPHI, MARYLAND: ADMINISTRATIVE DATA

Site Number ^a	Site Recorder ^b	Date of		SHPO Survey Number	Site Record Repository ^b	Survey Collection Policy ^c		Current Status of Investi- gation		NRHP Status ^d	State, Local Status		Architectural Association	Bibliographic Reference
		Site Record	1981											
HDLA-1	PRAS			NA	PRAS	SCL	NA	NA		RIP	NA		NA	Ciesna et al. 1982

Notes:

- Site number assigned by this report. HDLA = Harry Diamond Laboratories-Adelphi
- PRAS = Potomac River Archeology Survey, Anthropology Department, American University, Washington, D.C.
- SCL = surface collected
- RIP = recommended as ineligible by qualified professionals with no formal agency or SHPO concurrence

Table 4-2. PRESENTLY IDENTIFIED ARCHEOLOGICAL COMPONENTS ON THE HARRY DIAMOND LABORATORIES, ADELPHI - MARYLAND: DESCRIPTION AND EVALUATION

Site Number ^a	Unit Age			Unit Description							Evaluation			
	Temporal Unit			Dimension							Per-			
											cent			
	Date	Years BC/AD	Tradition	Phase (Period)	Artifacts	Features	Depositional Context	Landform	Area (m) ²	Depth (m)	Ascribed Function	In-tact	Value Integ- rity ^b	RVC
HDLA-1	NA	American	Pre Civil War	None	Mill Race	Surface	Small flood plain of minor drainage	NA	NA	Mill Race	0	N	0	2

Notes:

- Site number assigned by this report; HDLA = Harry Diamond Laboratories - Adelphi
- Value Integrity Codes: N = none
- RV = Research Value: 0 = no value
- CR = Confidence rating: 2 = judgment is moderately reliable

Table 4-3. PRESENTLY KNOWN ARTIFACT, ECOFACT, OR DOCUMENTARY COLLECTIONS FROM ARCHEOLOGICAL RESOURCES ON THE HARRY DIAMOND LABORATORIES -
ADELPHI, MARYLAND

Site Number, Name	Collection Characteristics					
	Collection Location	Artifact		Ecofact		Documentary
		Brief Description	Size/No.	Brief Description	Size/No.	
Curatorial Repository	Accession Number(s)	Brief Description	Size/No.	Brief Description	Size/No.	Size/No.

NONE

Table 4-4. POTENTIALLY IDENTIFIABLE BUT NOT PRESENTLY RECORDED
 ARCHEOLOGICAL RESOURCES ON THE HARRY DIAMOND LABORATORIES -
 ADELPHI, MARYLAND

Site Number, Name ²	Reference ^c	Description	Research Value CR ^b
HDLA-2 Mrs. Harper's Woolen Factory	Cissna et. al., 1982	19th century woolen factory	1

Notes:

- a. Site number assigned by this survey:
 HDLA = Harry Diamond Laboratories, Adelphi
- b. Research Value Confidence Rating
 1 = resource may have little value; it may or may not be located
 on the Harry Diamond Laboratories facility

5.0

AN ASSESSMENT OF THE SIGNIFICANCE OF THE ARCHEOLOGICAL RESOURCE BASE
ON THE HARRY DIAMOND LABORATORIES - ADELPHI, MARYLAND

5.1 THE SIGNIFICANT RESOURCE BASE

The millrace existing on the Harry Diamond Laboratories - Adelphi, Maryland is of little historic or archeological significance due to the degree to which the site has been disturbed and because of a lack of documentation. No standing structures or foundations are known to have survived, and no features were encountered during testing (Cissna et al. 1982). Other mills of the period in better states of preservation and with more complete documentation (i.e., Adelphi Mill, Paint Mill, and Powder Mill) exist in the Adelphi area (Table 5-1).

Some prehistoric sites are likely to exist on HDLA. These would be at best small transient camps with limited information potential, though the fact of their existence and any temporal/cultural diagnostics which might be present would represent valuable information. As such they are unlikely to be significant in and of themselves, but would be valuable in contributing to the Maryland prehistoric archeological site distribution data base.

5.2 IDEAL GOALS AND OBJECTIVES

Given the information available concerning archeological resources on HDLA, further formal survey needs to be done in the undisturbed upland areas of the facility. This survey should be able to determine if there are any archeological resources that should be considered significant.

Table 5-1. SUMMARY OF SIGNIFICANT ARCHEOLOGICAL RESOURCES ON THE HARRY DIAMOND LABORATORIES - ADELPHI, MARYLAND

Temporal Unit	Thematic Unit	Resource Type	Type Occurrence			Landform Assn.	Physical Integrity	Research Valueb	RV CRC	Socio-cultural Valuec	SCV CRb
			Known Occurrences (no.)	Potential Occurrences (no.)	Other Likely Occurrencesa						
Late Archaic	Stone tool manufacture	Lithic scatter	0	0	+	Level surface near streams	Unknown	1	2	0	2
American War Pre Civil	Local small industry	Water powered mill	0	0	-	Flood plain of stream	Unknown	1	2	-	-
		Mill race	1	0	-	Flood plain of stream	Poor	0	2	0	2

Notes:

- Other Likely Occurrences codes: - = not likely; + = likely; ++ = highly likely (likelihood greater than 50%)
- Research Value ranked from 0 (no value) to 5 (highest value)
- Research Value Confidence Rating and Sociocultural Value Confidence Rating codes:
1 = judgment is more guess than science; 2 = the judgment is moderately reliable;
3 = the judgment is most likely reliable; NA = not applicable; - = insufficient information
- Sociocultural Value ranked from 0 (no value) to 5 (highest value); - = insufficient information

6.0

A RECOMMENDED ARCHEOLOGICAL MANAGEMENT PLAN FOR THE HARRY DIAMOND
LABORATORIES - ADELPHI, MARYLAND

6.1 FACILITY MASTER PLANS

6.1.1 Proposed Construction

HDLA has six proposed development projects which will involve ground disturbance (Dwg. No. 18-04-34, sheet 3, 15 February 1982) (Table 6-1; Figure 6-1). This development includes construction of:

- a) a 150 ft. by 150 ft. open storage area adjoining the Mission Equipment Storehouse (Building 505);
- b) a 350 ft by 150 ft. 700-vehicle parking structure (No. 1) at the site of the parking lot off South Avenue;
- c) a 300 ft. by 100 ft. 450-vehicle parking structure (No. 2) adjoining the parking lot off North Avenue;
- d) a 400 ft. by 100 ft. general purpose laboratory (No. 3) at the site of the parking off North Avenue;
- e) a 1900 ft. extension of Kuester Road - north of the 400 sector; and
- f) the paving of a 700 ft. section of the service road adjoining Building 203.

The open storage area adjoins GDA 1 in a previously undisturbed, relatively flat area. No construction details are available, but limited grading and filling is anticipated which could affect any prehistoric sites which might exist in the area.

The construction of parking structure No. 2 and general purpose laboratory No. 3 are located in GDA 3 and the adjoining undisturbed area to the north. Since the construction of the existing parking lot in GDA 3 involved grading to depths of between 2-10 ft., it is unlikely that any archeological material remains in this area. No details are available on construction for parking structure No. 2, but it will probably require extensive excavation which could have an impact on any prehistoric remains in the adjoining undisturbed area, though the likelihood of finding remains in this area is minimal.

The proposed parking structure No. 1, GDA 6, was graded to a depth of 2-4 ft. during construction of the existing parking lot. It is unlikely that any archaeological remains exist in this area.

The extension of Kuester Road can be expected to require further

Table 6-1. A SUMMARY OF ON-GOING AND PLANNED ACTIVITIES ON THE HARRY DIAMOND LABORATORIES - ADELPHI, MARYLAND SITE THAT COULD AFFECT ARCHEOLOGICAL RESOURCES

Activities				Associated Resources				Impacts		
Description	Date	Area ^a	Size (a.)	Estimated Depth Below Surface (ft.)	Ratio of Disturbed to Total Area	Resource Class	Resources Known or Predicted	NRHP Status	Other Value	Mitigation Options
Construction of Open Storage Area	NA	NA	0.5	NA	NA	Prehistoric	NA	NA	NA	NA
Construction of Parking Structure No. 1	NA	6	1.2	NA	NA	NA	NA	NA	NA	NA
Construction of Parking Structure No. 2	NA	3	0.7	NA	NA	Prehistoric	NA	NA	NA	NA
Construction of General Purpose Laboratory No. 3	NA	3	0.9	NA	NA	NA	NA	NA	NA	NA
Extension of Kuester Rd.	NA	NA	1.3	NA	NA	Prehistoric	NA	NA	NA	NA
Paving of Service Rd. Adjoining Building 203	NA	5	0.5	NA	NA	NA	NA	NA	NA	NA

NOTES: a = Ground Disturbance Area

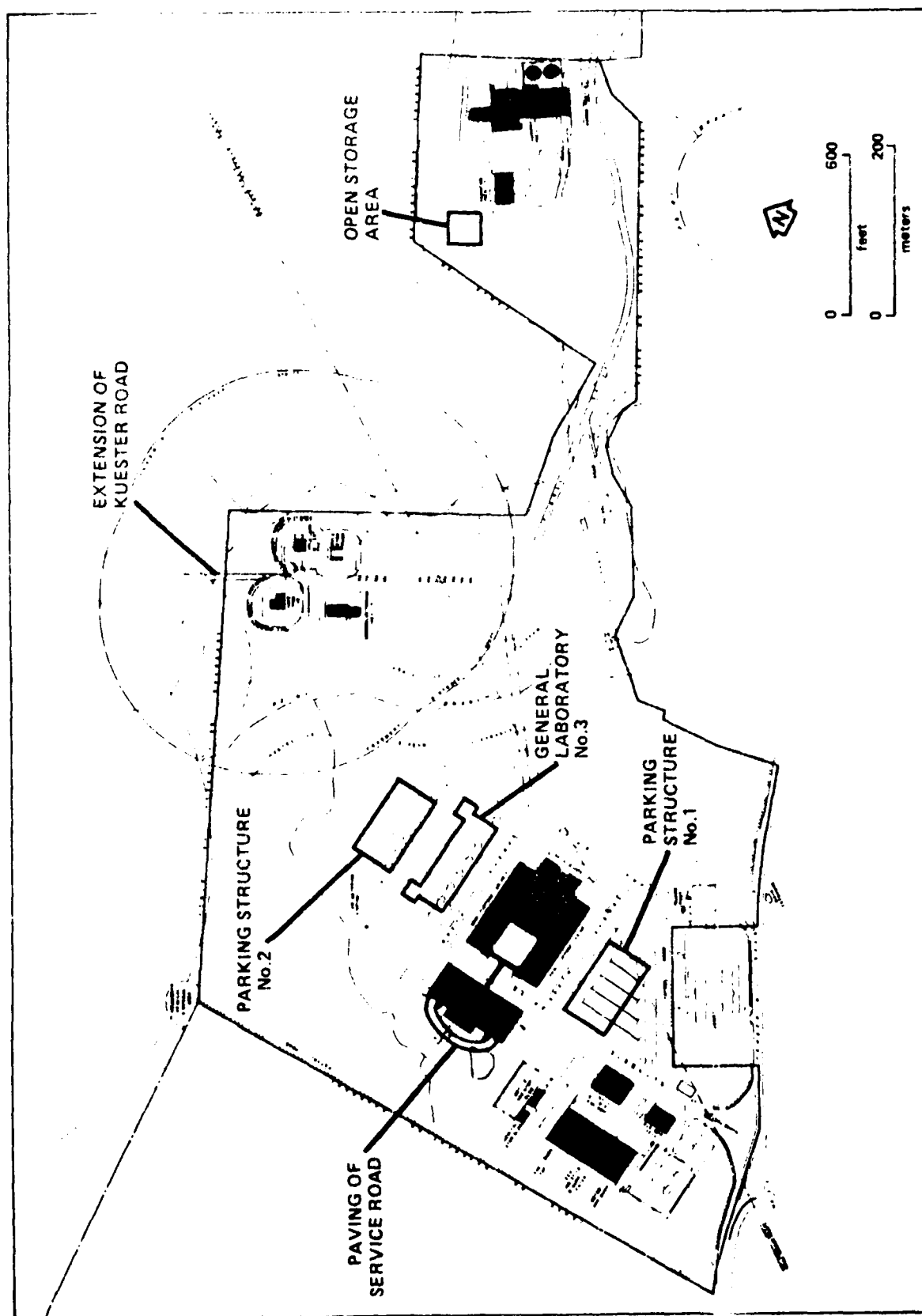


Figure 6-1. A MAP OF AREAS OF ONGOING OR PLANNED ACTIVITIES ON THE HARRY DIAMOND LABORATORIES - ADELPHI, MARYLAND.

grading which could have an impact on any existing archeological site in the vicinity. The paving of the service road to the west of Building 203 is unlikely to disturb any archeological remains, since it has already been graded and the area was probably disturbed during the construction of Building 203.

Currently there are no detailed plans, appropriation or start dates for these projects which represent ideal goals for future facility development (Jim Shropshire 1984, personal communication).

6.2 APPROPRIATE ARCHEOLOGICAL MANAGEMENT GOALS WITHIN THE HARRY DIAMOND LABORATORIES-ADELPHI, MARYLAND

6.2.1 General Facility Planning

Though less than 40 percent of the area of HDLA has been disturbed by actual construction activity, the erosional history of the area makes it unlikely that significant archeological resources exist on the facility. There still exists the possibility that archeological sites may exist in some of these undisturbed areas which have been unsurveyed with the exception of the course of Paint Branch. A primary planning goal for HDLA, in accordance with Sec. 110(a)(2) of the National Historic Preservation Act, is to determine if any of these areas contain archeological resources requiring further management. In general, it appears that any future development within areas identified as disturbed in Figure 3-1 will be unlikely to affect significant archeological resources. However, undisturbed areas of the facility should be formally surveyed to assess whether archeological remains are present.

Current and new employees at HDLA should be made aware of DARCOM's historic preservation responsibilities and told to report any archeological finds on HDLA property to the Facility Engineer (who should notify DARCOM and the SHPO). Any installation publication concerning rules and conduct should be revised to note that the removal or disturbance of archeological remains from HDLA property is prohibited. It is important to protect such remains from artifact hunters to preserve the integrity of the remains.

Finally, procedures should be developed for dealing with the unanticipated discovery of previously unrecorded archeological remains.

6.2.2 Project-Specific Resources Protection or Treatment Options

At the present time no planned or ongoing activity adversely affects known archeological remains at HDLA. Given the degree of disturbance present at GDA's on HDLA, proposed projects to construct parking structure No. 1 and general purpose laboratory No. 3 and the paving of the service road behind Building 203 are unlikely to encounter archeological remains and require no specific action. Testing should precede any ground disturbing activity in previously undisturbed areas affected by the construction of the extension of Kuester Road, the sector 500 open storage area, and the section of parking structure No. 2 which extends beyond GDA 3.

6.2.3 A Summary of Recommended Management Directons and Priorities for Effective Compliance and Program Development

The following rank ordered archeological resource management tasks and policies should be implemented by HDLA:

- o Conduct archeological survey in the undisturbed areas of the HDLA property;
- o Inform HDLA employees of DARCOM's historic preservation responsibilities; and
- o Develop procedures for dealing with the unanticipated discovery of previously unrecorded archeological remains and make on-call archeologist arrangements.

Additional recommendations are dependent upon results of studies suggested above and approval of specific future development plans.

6.3 ESTIMATED SCOPES-OF-WORK AND COST LEVELS FOR PRESENTLY IDENTIFIABLE MANAGMENT NEEDS

This section contains preliminary scopes-of-work for each of the various components of the archeological managment program outlined in Section 6.2.3. Certain specifications are common to many recommended work scopes, and unless specific mention is made of variations in these it should be assumed that they apply in all cases.

- o All work should conform to the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation.
- o All personnel must meet the minimum qualifications established in AR 420-40C for the position they will hold.
- o All excavation should be of a depth sufficient to reach sterile Pleistocene deposits or confirm prior disturbance.
- o All excavated material except that from excavation within clearly disturbed areas should be screened through 1/4 in. hardware cloth.

6.3.1 Archeological Survey of Undisturbed Areas

The undisturbed areas of HDLA should be formally surveyed for the presence of archeological remains. A recommended model should involve 100 ft. wide transects with shovel test excavations at the discretion of the Field Director in areas where the slope allows and where ground cover obscures the surface. These are particularly important in areas where there is a high probability of locating sites, such as terraces along streams. This will require approximately 15 person-days for fieldwork and 8 person-days for analysis and report

preparation at a cost of about \$10,000-9,000, including approximately \$3,500 in out-of-pocket expenses.

6.3.2 Education Programs

During any orientation for newly assigned personnel or employees, mention should be made of DARCOM's historic preservation responsibilities. In addition, all contractors, Army personnel, dependents, and visitors should be advised to immediately report the discovery of any archeological remains to the Facility Engineer (who should in turn notify DARCOM and the State Historic Preservation Officer). These same individuals should also be advised that, as per AR 420-40-1.4f(5), unauthorized collection of archeological and cultural materials is a felony and subject to prosecution. Any installation publication concerning rules and conduct on HDLA should be revised to include these requirements and warnings. In addition, in accordance with AR 420-40-1.4e(11), military police and other security personnel should be trained to enforce laws protecting historical and cultural properties.

It is estimated that revision of installation publications will require one day of a professional archeologist's time at an estimated cost of \$500. Unestimated expenses would include publication costs and time expended by installation personnel during briefings and orientation.

6.3.3 Emergency Discovery Procedures

Procedures for dealing with the discovery of historic properties (including archeological sites) are detailed in AR 420-40-4.10. In the event of an unanticipated discovery, the installation commander or his designee should notify the Department of the Interior Departmental Consulting Archeologist. DARCOM and the State Preservation Officer should be notified at the same time.

To assist HDLA in conducting any archeological evaluations and/or necessary data recovery activities which may be required as a result of an unanticipated discovery in the shortest time possible, it is recommended that HDLA enter into an on-call service agreement with an institution or firm which can provide professional archeological consulting services. At the option of HDLA, a contract for the services could be issued on either a sole-source or competitive basis. In the case of the former, approximately three days of installation personnel time would be required. In the latter case, a greater but unknown amount of time would be required of installation personnel to prepare and issue a formal Request-for-Proposal and to evaluate responses.

A review of all the major information sources likely to have data pertinent to the prehistoric and historic archeology of the site occupied by the Harry Diamond Laboratories - Adelphi, Maryland was conducted for this study. No archeological sites were discovered during this review. The single survey conducted on the HDLA grounds was for a proposed sewer line. Isolated projectile points finds are reported to have come from the facility. Based on our current knowledge, prehistoric archeological sites can be predicted to be small, transient camps similar to lithic scatters which may or may not have temporal and cultural diagnostics.

Institutions consulted as part of the basic data gathering for this overview include: Library of Congress; National Archives - Modern Military Branch, Navy and Old Army Branch and Still Photo Branch; Anthropological Archives - National History Museum - Smithsonian Institution; Maryland Room - University of Maryland Library; Maryland Archives - Maryland Historical Society; Maryland Archives - Georgetown University; Catholic University of America; Harry Diamond Laboratories Environmental Office; Museum of the American Indian - Heye Foundation; and the New York Public Library Map Division. In addition the "America; History and Life" database of Lockheed's Dialog Information Retrieved Services, which contains abstract from more than 2000 history journals, was also consulted.

Two visits was made to the Harry Diamond Laboratories - Adelphi, Maryland by the authors. In addition to a general walkover of the site, drawings and materials maintained by the Facilities Engineer's Office were examined.

Portions of HDLA have been disturbed by construction of extant structures. However, portions of the facility are essentially undisturbed. The presence and physical integrity of the archeological cultural resources within any of these areas cannot be determined at this time, though there exists a low probability that significant sites exist.

Recommendations offered in this overview include archeological survey in unsurveyed, undisturbed areas of HDLA; preparation of procedures for unanticipated discoveries of archeological resources; and an education program to advise HDLA personnel of DARCOM's obligations to protect cultural resources.

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