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Draft

Environmental Impact Statement

Comprehensive Base Realignment/Closure and Fort Belvoir Development

June 1991

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Prepared by:

U.S. ARMY CORPS OF ENGINEERS

Baltimore District

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NOTICE

This Analysis includes discussions of two separate proposals which are in the developing stage: the Engineer Proving Ground (EPG) initiative and the Fort Belvoir Concept Development Plan (CDP). Neither of these proposals is developed sufficiently for decision. Each will be the subject of separate analysis under the National Environmental Policy Act prior to decision by the Army. They are included in this EIS to provide the most highly developed context within which to assess the proposed Base Realignment and Closure actions.

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Environmental Impact Statement

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91-07382



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Execution of some of the decisions analyzed in this document are subject to change based on the Defense Base Closure and Realignment Act of 1990. Specifically, the Secretary of Defense has recommended to the newly formed Defense Base Closure and Realignment Commission the relocation of selected information Systems command elements from Fort Belvoir to Fort Ritchie or another location within the National Capital Region, rather than Fort Devens, and to relocate the Army Materials Technology Laboratory activities from Watertown, Massachusetts to Aberdeen Proving Ground, Maryland, rather than Fort Belvoir. These proposals will be subject to additional environmental impact analyses.

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DRAFT ENVIRONMENTAL IMPACT STATEMENT

COMPREHENSIVE BASE REALIGNMENT/CLOSURE AND FORT BELVOIR DEVELOPMENT

LEAD AGENCY: Department of the Army, Headquarters, Military District of Washington

TITLE OF THE PROPOSED ACTION: Comprehensive Base Realignment/Closure and Fort Belvoir Development

AFFECTED JURISDICTIONS: Fort George G. Meade, Anne Arundel County, Maryland; Fort Holabird, Baltimore City, Maryland; Cameron Station, City of Alexandria, Virginia; Fort Myer, Arlington County, Virginia; Fort McNair, Washington, DC; Fort Belvoir, Fairfax County, Virginia; Fort Devens, Middlesex County, Massachusetts; and Army Material Technology Laboratory, Watertown, Massachusetts.

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ABSTRACT: This document addresses the environmental effects resulting from the closure of Cameron Station and associated realignments to Fort Belvoir, Fort, Meyer, and Fort McNair. This document also addresses the realignments from Fort Meade, Fort Holabird, Army Material Testing Laboratory (AMTL), and leased space to Fort Belvoir. The effects on Fort Belvoir of the realignment of the Information Systems Command to Fort Devens are included in this document. These realignments and the closure of Cameron Station are a few of the many realignments and closures approved by the Secretary of Defense.

This document also describes the effect the realignment of personnel will have on Fort Belvoir, Fort Myer, and Fort McNair. The planned closures will produce personnel relocations as follows: 3,641 personnel from Cameron Station to Fort Belvoir, 192 to Fort Myer, and two to Fort McNair; 178 from AMTL to Fort Belvoir; 131 from Forts Meade and Holabird to Fort Belvoir; from leased space in northern Virginia, 220 to Fort Belvoir and 106 to Fort Devens; and 320 Information System Command personnel from Fort Belvoir to Fort Devens. Numbers of personnel may fluctuate and are therefore approximate. The Army is coordinating reuse options for Cameron Station with the City of Alexandria through the Task Force to Monitor the Closing of Cameron Station. At this time, the best option proposes a privately developed, primarily residential, mixed-use development. Actions at Fort Belvoir include 10 preferred alternatives directly related to the realignment, and more than 60 projects proposed as part of the Fort Belvoir Concept Development Plan. The most significant result of the realignment will be an increase in traffic volume at Fort Belvoir. Effects of the proposed Concept Development Plan projects can best be minimized by re-examining preliminary proposed siting of these activities, which will be the subject of separate environmental analyses. Public review comments must be made before July 29, 1991.

WDCR504/001.51

SUMMARY

INTRODUCTION

This document addresses the environmental effects resulting from the closure of Cameron Station and associated realignments to Fort Belvoir, Fort Meyer, and Fort McNair. This document also addresses the realignments from Fort Meade, Fort Holabird, Army Material Testing Laboratory (AMTL), and leased space to Fort Belvoir. The effects on Fort Belvoir of the realignment of the Information Systems Command (ISC) to Fort Devens are also included in this document. These realignments and the closure of Cameron Station are a few of the many realignments and closures approved by the Secretary of Defense.

The Secretary of Defense established the Base Realignment and Closure Commission (the Commission) on May 3, 1988, to recommend military installations within the United States, its commonwealths, territories, and possessions for realignment and closure. The Defense Authorization Amendments and Base Closure and Realignment Act of 1988 (Public Law 100-526) authorized such realignments and closures. The Commission presented its recommendations to the Secretary of Defense on December 29, 1988.

The Commission recommended the closure of Cameron Station in Alexandria, Virginia, and the realignment of its personnel to Fort Belvoir, Fairfax County, Virginia; Fort Myer, Arlington County, Virginia; and Fort McNair, Washington, D.C. In addition, the Commission recommended the closure of the AMTL in Watertown, Massachusetts, and the relocation of the corrosion prevention and control research activities to Fort Belvoir.

The Commission also recommended the partial closure of Fort Meade and Fort Holabird in Maryland. The Criminal Investigation Command (CIDC) and the Crime Records Center (CRC) from these installations will be consolidated at Fort Belvoir along with additional CIDC and ISC support personnel currently located in leased space. The Commission also recommended the realignment of the ISC activities currently located at Fort Belvoir, to Fort Devens, Massachusetts.

The Environmental Impact Statement (EIS) for the Military District of Washington Comprehensive Base Realignment and Closure and Fort Belvoir Development addresses the environmental impacts of the closure of Cameron Station and the realignments to Fort Belvoir, Fort Myer, and Fort McNair. It also addresses the effects on Fort Belvoir of the realignments from AMTL, Fort Meade, Fort Holabird, and leased space. The effects of these actions on their originating installations are being addressed in separate EISs. The Fort Belvoir EIS also examines the effects on Fort Belvoir of the realignment of ISC to Fort Devens. The effects of this realignment on Fort Devens are being addressed in a separate EIS.

In addition to the effects of the closures and realignments recommended by the Commission, this EIS also addresses the potential effects of the proposed Concept Development Plan (CDP) on Fort Belvoir. The CDP is included in this document to provide a basis for evaluating the cumulative effects of the base realignment and closure (BRAC) projects at Fort Belvoir. This EIS, however, is not the decision document for the CDP.

The CDP was developed as a way to plan for future growth at Fort Belvoir. More than 60 projects, many of which to date have not been approved or funded, are proposed in the CDP. The CDP will be incorporated into the Fort Belvoir Master Plan that is scheduled to be completed in fiscal year 1992. The Master Plan update and its associated EIS will provide the cumulative environmental analyses and documentation required for the CDP projects.

PROPOSED ACTION

Base Realignment and Closure

The realignments discussed above involve the transfer of personnel, positions, and equipment among installations. Table S-1 presents a summary of the numbers of personnel being realigned to and from each of the affected installations covered by this EIS.

Table S-1
Summary of Personnel Realignments*

From Originating Installation	To Receiving Installation			
	Fort Belvoir	Fort Myer	Fort McNair	Fort Devens
Cameron Station	3,641	192	2	0
Fort Belvoir	---	---	---	320
AMTL	178	---	---	---
Fort Meade and Fort Holabird	131	---	---	---
Leased Space	220	---	---	106

*All numbers for personnel in this table are subject to fluctuations and are therefore approximate.

In addition to the realignment of personnel and positions, BRAC requires the renovation of existing facilities and the construction of new facilities at Fort Belvoir and Fort Myer. Ten construction projects are planned at Fort Belvoir and four are planned at Fort Myer to accommodate the BRAC activities. These projects are listed in Table S-2. Site-specific decisions for all proposed construction projects will be supported by subsequent NEPA analysis.

Table S-2
BRAC Construction Projects

Installation	Construction Project
Fort Belvoir	Headquarters Complex (BRAC 1)
	Industrial Park (BRAC 2)
	BRAC Roads (BRAC 3)
	Commissary Warehouse Addition (BRAC 4)
	Post Exchange (BRAC 5)
	Commissary (BRAC 6)
	Administration Facility (BRAC 7)
	Material Research Facility (BRAC 8)
	Exchange Branch (BRAC 9)
	Modify Buildings 1466 and 1445 for Base Closure (BRAC 10)
Fort Myer	PX Expansion
	Shoppette
	Commissary
	Logistics Complex

Public Law 100-526 also requires that potential reuse options for Cameron Station be identified. The U.S. Army has been working with the public and with the City of Alexandria through the Task Force to Monitor the Closing of Cameron Station on the future reuse of the property. The City of Alexandria has zoned the property for a mixed-use development, which is primarily residential development, interspersed with some commercial and industrial development. However, Public Law 100-526 requires that a formal screening process be used to dispose of military installations designated for closure. Under this process, the disposal options for Cameron Station are, in order of priority:

1. Transfer the facility to another agency within the Department of Defense.

2. If no interest is expressed, then offer the property to homeless providers under Section 501 of the McKinney Act (P.L. 100-77).

3. If no interest is expressed in option 2, then offer the property for sale to other federal, state, and local government agencies.

4. If no interest is expressed in option 2 or option 3, then offer the property for sale to private purchasers through competitive bid.

Studies have been initiated to define the extent of any environmental contamination at Cameron Station. These studies will help in adequately assessing the health and environmental risks associated with closure; in determining the necessity for remedial action; and in developing and evaluating the remedial alternatives necessary to prepare the property for release. Remediation, if determined to be necessary, would be coordinated and conducted in compliance with federal, state, and local standards and regulations to remove any health and environmental threats.

Fort Belvoir Concept Development Plan

More than 60 projects have been proposed as part of the CDP. These projects include office and administration centers; child care, community, and recreational facilities, test facilities and laboratories; new housing and housing improvements; utility upgrades; and transportation improvements. Although proposed, many of these projects have not been approved or funded to date. These projects are divided into four categories, Military Construction Activity (MCA); Non-Appropriated Funds (NAF); Army and Air Force Exchange Services (AAFES); and Army Family Housing (AFH).

Potential sites for the CDP projects have been identified by Fort Belvoir planners. The alternatives for these projects will include project justification, final siting, timing of project initiation, and the no-action alternative. Final siting will be completed as the National Environmental Policy Act (NEPA) documentation for each project is completed. The Master Plan, which is scheduled for completion in fiscal year 1992, will contain the cumulative environmental analyses and documentation required for these projects.

ENVIRONMENTAL ISSUES AND CONCERNS

The Army met with resource agencies in the summer and fall of 1989 to develop the scope for this EIS and initiate formal coordination. Two meetings were held to inform the public of the Army's CDP activities and intentions for base closure. Both written and oral comments were received about the wide ranging issues, the most common concern being how the Army would address the effects of development at Fort Belvoir on transportation. Other comments were received on environmental issues, including wildlife, wetlands, floodplains, and endangered species. The public also wanted to be

kept informed about the studies being initiated in order to evaluate the potential effects of the Army's proposals. The Army worked closely with public agencies to develop this EIS.

CONSEQUENCES OF THE PROPOSED ACTIONS

Closure of Cameron Station

No significant adverse effects are expected as a result of the closure of Cameron Station. The loss of 3,835 military and civilian positions is not considered to be a significant adverse effect because most of the people affected by the closure will be relocated within the region. Upon closure, local traffic volumes should decrease slightly. Table S-3 presents a summary of the effects expected to result from the closure of Cameron Station.

The most visible effect of the closure will be the change in land use once Cameron Station is sold. Contamination assessments and any required remediation will be completed before this occurs.

Realignment of Activities to Fort Belvoir

The most significant adverse effects of the BRAC projects at Fort Belvoir will be the increase in traffic volumes and potential changes in commuter patterns. To assess the effects of these developments, future-year traffic forecasts were prepared using a region-wide transportation model. Land use assumptions were based on current-year estimates and future-year forecasts that were developed by individual jurisdictions and refined and compiled by the Metropolitan Washington Council of Governments into the *MWCOG Cooperative Forecasts, Round IV.*

Baseline transportation systems were defined for each of the analysis years (i.e., 1995, 2000, and 2010) in order to provide a benchmark for determining the impact of the proposed development. The baseline systems contain improvements that are planned or programmed by public agencies to be in place, and any other improvements required to accommodate future-year baseline traffic conditions. The baseline transportation systems encompass the principal travel modes in northern Virginia. These include the roadway network, the high-occupancy vehicle (HOV) lane network, and the existing and planned transit systems (rail and bus).

The development scenarios that were evaluated for the traffic analyses are:

- Cameron Station--760,000 gross square feet of commercial space and 1,800 dwelling units to replace existing development; in place by 2000
- Fort Belvoir Base Realignment and Closure--a net increase of 3,856 jobs on the North Post and the Main Post; in place by 1995

Table S-3
SUMMARY OF EFFECTS OF CLOSURE ON CAMERON STATION*

Resource	Effect
Physiography & Topography	No significant effects expected.
Geology & Groundwater	No significant effects expected. However, reuse could be affected by the 100-year floodplain that encompasses 97 percent of the site.
Soils	No significant effects expected. Implementation of best management practices during redevelopment will minimize potential effects.
Surface Water	No impact
Climate & Air Quality	No impact
Vegetation	No impact
Wildlife	No impact
Wetlands	No impact
Aquatic Biota	No impact
Threatened & Endangered Species	No impact
Land Use	The land use at Cameron Station will change significantly under the proposed reuse scenario.
Population	3,835 positions will be realigned as part of the closure of Cameron Station. However, this is not significant because the personnel shifts occur within the same region. The loss of 112 civilian and 2 military positions is not considered to be a significant regional impact.
Housing	No significant effects expected.
Employment	3,949 positions will be lost when Cameron Station is closed. However, all but 114 of these positions are being realigned to other posts within the region and no significant effects are expected.
Income	No significant effects expected because the personnel being realigned are expected to remain in the region.
Community & Army Facilities	No significant effects expected because additional facilities will be constructed to replace those eliminated.
Traffic & Transportation	The closure should reduce traffic volumes somewhat. Additional traffic analysis will be needed when a specific reuse plan is developed.
Cultural Resources	NHPA Section 106 and 110 coordination will be completed by the Army before disposal.
Hazardous Materials	Contamination assessments are being conducted. Remediation will be completed as necessary.

*All numbers for personnel in this table are subject to slight fluctuations and are therefore approximate.

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- Fort Belvoir Concept Development Plan--a net increase of 1,500 jobs and 1,500 dwelling units on the North Post and the Main Post; in place by 2000

- EPG--a total of 1,165,000 gross square feet of commercial space and 525 dwelling units in 1995; 4.1 million square feet of commercial space and 2,275 dwelling units in 2000; and 9.7 million square feet of commercial space and 5,600 dwelling units in 2010

As the Washington, D.C., metropolitan area continues to grow during the next 20 years, there will be a need to improve and enhance the current transportation system in northern Virginia. The Virginia Department of Transportation, Fairfax County, City of Alexandria, Metropolitan Washington Council of Governments, and the Washington Metropolitan Area Transit Authority have developed plans to address the anticipated needs. Construction of the Fairfax County Parkway and the Franconia-Springfield Parkway, the extension of the Shirley Highway HOV express lanes, the planned extension of the Metrorail system to Franconia-Springfield, initiation of regional commuter rail service, and the widening of the Capital Beltway are examples of actions geared to improve the region's mobility.

Traffic generated by the planned development at Fort Belvoir, EPG, and Cameron Station will affect area traffic conditions. Determining the number of trips each of these developments will generate, as well as the travel patterns these trips will create, is relatively straightforward (see Figure S-1). Determining the specific off-site improvements that these new developments will require, as well as the additional needs continually being created by other regional development, is more difficult. Many of the off-site improvements, which are identified as being needed to support one or more of the Army developments, would be required within several years even without any Army development. The Army's developments account for merely a part of the total development-related transportation needs in northern Virginia and, in most cases, merely accelerate the need for an improvement that would be required at a later date regardless of Army activity.

Mitigation

Practicable highway improvements necessitated by construction of the BRAC projects at Fort Belvoir will be determined jointly and will be funded as negotiated by the Virginia Department of Transportation, Fairfax County, and the Department of the Army. These improvements include the addition of left- and right-turn lanes, traffic signals or signal upgrades, and traffic lanes or participation in new highway projects. These improvements will help to alleviate traffic generated by the Army development south of Telegraph Road, between Backlick Road and Beulah Street.

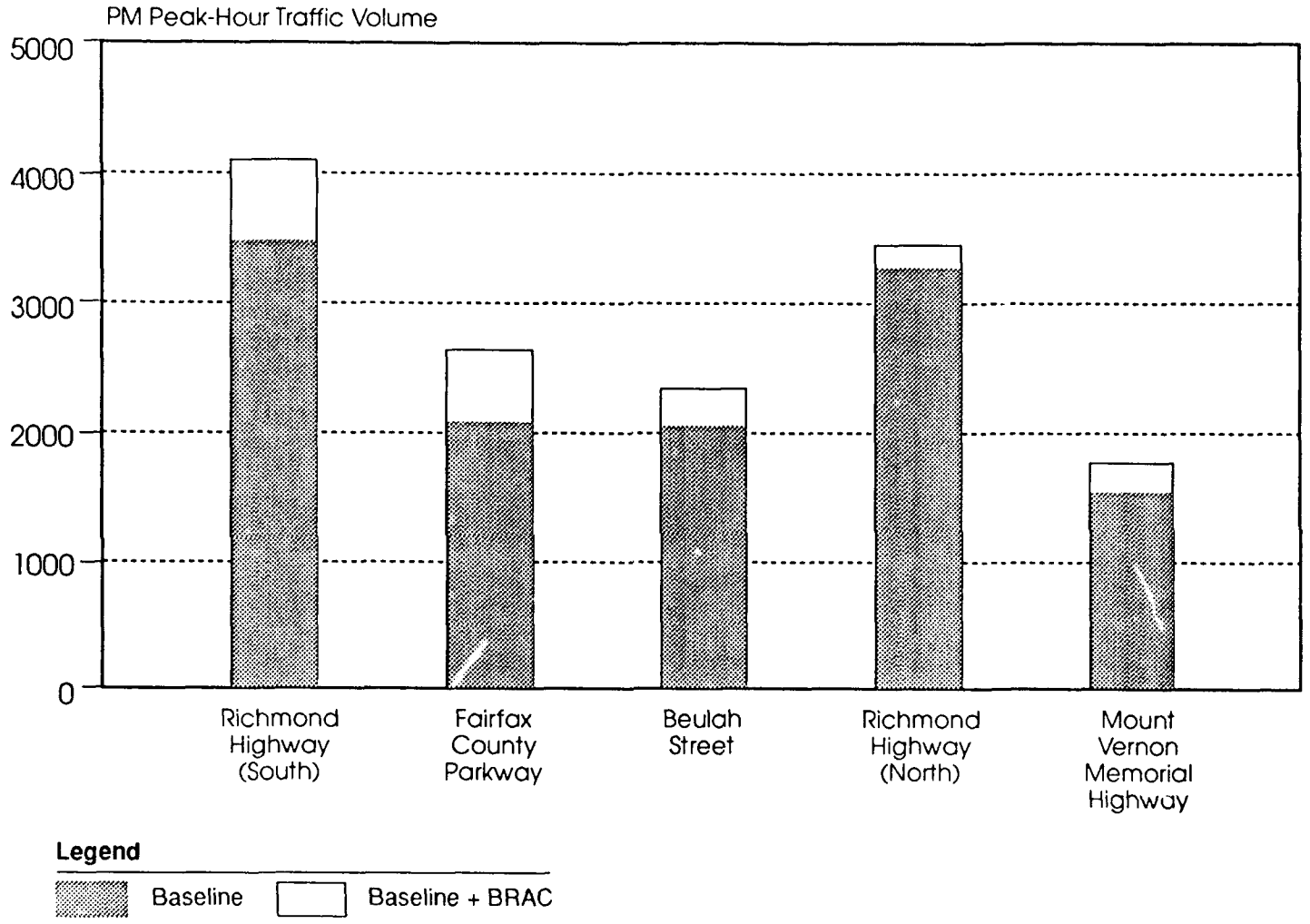


Figure S-1
Impact of BRAC Traffic

Approximately 2.8 acres of nontidal wetlands lost by the construction of the Headquarters Complex and BRAC Roads will be replaced in keeping with the President's policy of "no net loss of wetlands." Chesapeake Bay Preservation Areas have been mapped for all of the proposed BRAC sites, and the Army will comply with the provisions of the Chesapeake Preservation ordinance adopted by Fairfax County to minimize the effects of these projects on the Chesapeake Bay and its tributaries. Best management practices (BMPs), including stormwater management, will reduce the amount of sedimentation during and after construction of the new projects.

Oversized box culverts, which allow the safe movement of wildlife between habitat areas in the genetic corridor, will be incorporated into the design of BRAC Roads. A genetic corridor is defined as a band of native vegetation that allows for the movement of species between larger patches of habitat, thus, allowing species to survive in landscapes where they would not normally occur. In addition to the box culverts, a 250- to 300-foot buffer of native vegetation will be maintained to the north and west of the Headquarters Complex to ensure that the genetic corridor is not severed in this area. All cultural resource surveys will be completed for each of the BRAC project sites before construction begins.

The BRAC Roads, the commissary, post exchange, and exchange branch projects will provide some of the road improvements and additional services necessary to accommodate the net population increase of 3,856 people expected at Fort Belvoir as a result of the BRAC activities.

Table S-4 presents a summary of the effects of the preferred alternative for each project and Table S-5 summarizes the cumulative effects of all of the BRAC actions at Fort Belvoir. Figure S-2 shows the approximate location of each of the BRAC projects at Fort Belvoir. Table S-6 summarizes the status of compliance with environmental quality protection statutes for each BRAC project. Environmental effects will be mitigated. All federal, state, and local regulations will be complied with during the development of the BRAC projects. All required permits will be obtained.

Realignment of Activities to Fort Myer

No significant adverse effects are expected to result from realignment of activities to Fort Myer. Final site design for each of the four planned construction projects will minimize cut and fill. Cultural resource surveys and subsurface soil investigations will be completed for each of the sites before construction begins.

Increases in stormwater runoff at each of the project locations will be mitigated by BMPs and the implementation of a stormwater management plan that will contain post-construction runoff at pre-construction levels. Wetlands, Chesapeake Bay Preservation Areas, threatened and endangered species, wildlife, game species, and aquatic biota will not be affected by any of the proposed actions.

Table S-4
SUMMARY OF EFFECTS OF PROPOSED BRAC ACTIONS AT FORT BELVOIR*

Resource	BRAC 1 Headquarters Complex Effect
Physiography & Topography	Minor impact because final site design will minimize cut & fill.
Geology & Groundwater	No impact.
Soils	No impact because soils have no building constraints.
Surface Water	Minor impact because of an ephemeral stream on site.
Climate & Air Quality	No impact.
Wildlife Genetic Corridor	Minor impact because construction will constrict corridor. However, site design will include 250- to 300-foot vegetated buffer to maintain corridor.
Vegetation	No impact.
Wildlife	Minor impact because road kills could increase; vegetated buffer (see "Wildlife Genetic Corridor" above) can minimize.
Game Species	Same as above.
Wetlands	Minor impact because .4 acres of nontidal wetlands were identified during the jurisdictional delineation as being affected. The affected wetlands will be replaced.
Aquatic Biota	No impact.
Threatened & Endangered Species	No impact.
Land Use	No impact because project is compatible with existing land use.
Population	Minor impact because project will increase population at Fort Belvoir by 3,208 employees.
Housing	No impact.
Employment	Minor impact because project will increase employment at Fort Belvoir by 3,208 employees.
Community & Army Facilities	Minor impact because project will increase demand on some facilities; will generate an additional 6 tons per day of solid waste, will participate in recycling program.
Traffic & Transportation	Major impact because a road network will be needed, BRAC 3, north, will mitigate effect.
Cultural Resources	Impacts will be minimal because a Phase I survey will be completed on the site.
Hazardous Materials	No impact because minimal amounts of hazardous materials will be generated and disposed of according to regulations.

*All numbers for personnel in this table are subject to fluctuations and are therefore approximate.

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Table S-4
SUMMARY OF EFFECTS OF PROPOSED BRAC ACTIONS AT FORT BELVOIR*

Resource	BRAC 2 Industrial Park Effect
Physiography & Topography	Minor impact because site is located adjacent to closed debris landfill.
Geology & Groundwater	No impact.
Soils	Minor impact because soils are 100 percent high water table; may present engineering constraints that could affect site layout.
Surface Water	No impact.
Climate & Air Quality	No impact.
Wildlife Genetic Corridor	No impact.
Vegetation	No impact.
Wildlife	No impact.
Game Species	No impact.
Wetlands	No impact.
Aquatic Biota	No impact.
Threatened & Endangered Species	No impact.
Land Use	No impact because project is compatible with existing land use.
Population	Minor impact because project will increase population at Fort Belvoir by 155 employees.
Housing	No impact.
Employment	Minor impact because project will increase employment at Fort Belvoir by 155 employees.
Community & Army Facilities	Minor impact because project will increase demand on some facilities; will generate an additional 0.32 tons per day of solid waste, will participate in recycling program.
Traffic & Transportation	Minor impact because a local road network will be needed. BRAC 3, south, will mitigate effect.
Cultural Resources	Impact will be minimal because a Phase I survey will be completed on the site.
Hazardous Materials	No impact because the minimal amounts of hazardous materials will be generated and disposed of according to regulations.

*All numbers for personnel in this table are subject to fluctuations and are therefore approximate.

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Table S-4
SUMMARY OF EFFECTS OF PROPOSED BRAC ACTIONS AT FORT BELVOIR*

Resource	BRAC 3, North BRAC Roads Effect	BRAC 3, South BRAC Roads Effect
Physiography & Topography	Minor impact because final site design will minimize cut & fill.	Minor impact because final site design will minimize cut & fill.
Geology & Groundwater	No impact.	No impact.
Soils	7 percent hydric soil, 19 percent high water table; 11 percent steep slopes; may present engineering constraints that could affect site layout.	5 percent high water table; may present engineering constraints that could affect site layout.
Surface Water	Minor impact, will need culverts to minimize effects.	Minor impact will need culverts to minimize effects.
Climate & Air Quality	No impact.	No impact.
Wildlife Genetic Corridor	Minor impact because the road will be designed with bridges and box culverts to permit safe movement of wildlife within corridor.	No impact; outside corridor.
Vegetation	Minor impact because clearing will be required in the right-of-way.	Minor impact because minimal clearing will be required.
Wildlife	Minor impact because road kills could increase; box culverts (see above) could minimize numbers of road kills.	Minimal effects are expected because of the developed nature of most of the right-of-way.
Game Species	Same as above.	Same as above.
Wetlands	Minor impact because approximately 2.1 acres of nontidal wetlands will be affected. All of the affected wetlands will be replaced.	Minor impacts expected because approximately .3 acres of nontidal wetlands will be affected. All of the affected wetlands will be replaced.
Aquatic Biota	Minor impact because of temporary construction impacts; best management practices will be used to minimize downstream sedimentation.	Minor impact because of temporary downstream effects during construction; best management practices will be used to minimize downstream sedimentation.
Threatened & Endangered Species	Minor impact expected, however, a complete survey required for final right-of-way; wood turtles located near intersection with Woodlawn Road.	No impact.
Land Use	No impact.	No impact.
Population	No impact.	No impact.
Housing	No impact.	No impact.
Employment	No impact.	No impact.
Community & Army Facilities	Will mitigate effects of BRAC 1.	Will mitigate effects of BRAC 2.
Traffic & Transportation	Should improve traffic locally.	Should improve traffic locally and isolate truck traffic.
Cultural Resources	Impacts will be minimal because a Phase I survey will be completed for the right-of-way.	Impacts will be minimal because a Phase I survey will be completed for the right-of-way.
Hazardous Materials	No impact.	No impact.

*All numbers for personnel in this table are subject to fluctuations and are therefore approximate.

Table S-4
SUMMARY OF EFFECTS OF PROPOSED BRAC ACTIONS AT FORT BELVOIR*

Resource	BRAC 4 Commissary Warehouse Addition Effect	BRAC 5 Post Exchange Effect	BRAC 6 Commissary Effect
Physiography & Topography	No impact.	No impact.	Final site design will minimize cut & fill.
Geology & Groundwater	No impact.	No impact.	No impact.
Soils	No impact.	Minor impact 100 percent high water table; possible building constraints that could affect site layout.	Minor impact 100 percent high water table; possible building constraint that could affect site layout.
Surface Water	No impact.	No impact.	No impact.
Climate & Air Quality	No impact.	No impact.	No impact.
Wildlife Genetic Corridor	No impact; outside corridor.	No impact.	No impact.
Vegetation	No impact.	No impact; site already cleared.	No impact.
Wildlife	No impact.	No impact.	No impact.
Game Species	No impact.	No impact.	No impact.
Wetlands	No impact.	No impact.	No impact.
Aquatic Biota	No impact.	No impact.	No impact.
Threatened & Endangered Species	No impact.	No impact.	No impact.
Land Use	No impact.	No impact because site is compatible with existing land use.	No impact because site is compatible with existing land use.
Population	No impact.	Will increase population.	Will increase population.
Housing	No impact.	No impact.	No impact.
Employment	No impact.	Will increase employment.	Will increase employment.
Community & Army Facilities	No impact.	Minor impact; however, project will mitigate effects of BRAC (Cameron Station Post Exchange closure); will increase solid waste generation, will participate in recycling program (specifically cardboard recycling).	Minor impact; however, project will mitigate effects of BRAC (Cameron Station Commissary closure); will increase waste generation, design will accommodate cardboard recycling.
Traffic & Transportation	No impact.	Minor impact because project will increase local traffic.	Minor impact because project will increase local traffic.
Cultural Resources	No impact.	No impact.	No impact.
Hazardous Materials	No impact.	No impact.	No impact.

*All numbers for personnel in this table are subject to fluctuations and are therefore approximate.

Table S-4
SUMMARY OF EFFECTS OF PROPOSED BRAC ACTIONS AT FORT BELVOIR*

Resource	BRAC 7 Administration Facility Effect	BRAC 8 Material Research Laboratory Effect
Physiography & Topography	No impact.	Minor impact because final site design will minimize cut & fill.
Geology & Groundwater	No impact.	No impact.
Soils	No impact.	Minor impact because soils are 15 percent high water table; may present engineering constraints that affect site layout.
Surface Water	No impact.	No impact.
Climate & Air Quality	No impact.	No impact.
Wildlife Genetic Corridor	No impact.	No impact.
Vegetation	No impact.	No impact.
Wildlife	No impact.	No impact.
Game Species	No impact.	No impact.
Wetlands	No impact.	No impact.
Aquatic Biota	No impact.	No impact.
Threatened & Endangered Species	No impact.	No impact.
Land Use	No impact because project is compatible with existing land use.	No impact because project is compatible with existing land use.
Population	Minor impact because project will increase population at Fort Belvoir by 351 employees.	Minor impact because project will increase population at Fort Belvoir by 200 employees.
Housing	No impact.	Minor impact because project will increase area demand slightly.
Employment	Minor impact because project will increase employment at Fort Belvoir by 351 employees.	Minor impact because project will increase employment at Fort Belvoir by 200 employees.
Community & Army Facilities	No impact on most facilities; will generate an additional 0.72 tons per day of solid waste, will participate in recycling program.	Minor impact because project will increase demand on some facilities; will generate an additional 0.38 tons per day of solid waste, will participate in recycling program.
Traffic & Transportation	Minor impact because project will increase local traffic.	Minor impact because project will increase local traffic.
Cultural Resources	No impact.	Impacts will be minimized because a Phase I survey will be completed on the site.
Hazardous Materials	No impact because asbestos in building will be removed before renovation.	No impact because minimal amounts of hazardous materials will be generated and disposed of according to regulations.

*All numbers for personnel in this table are subject to fluctuations and are therefore approximate.

Table S-4
SUMMARY OF EFFECTS OF PROPOSED BRAC ACTIONS AT FORT BELVOIR*

Resource	BRAC 9 Exchange Branch Effect	BRAC 10 Modify Buildings 1466 & 1445 for Base Closure Effect
Physiography & Topography	Minor impact because final site design will minimize cut & fill.	No impact.
Geology & Groundwater	No impact.	No impact.
Soils	No impact.	No impact.
Surface Water	No impact.	No impact.
Climate & Air Quality	No impact.	No impact.
Wildlife Genetic Corridor	No impact.	No impact.
Vegetation	No impact.	No impact.
Wildlife	No impact.	No impact.
Game Species	No impact.	No impact.
Wetlands	No impact.	No impact.
Aquatic Biota	No impact.	No impact.
Threatened & Endangered Species	No impact.	No impact.
Land Use	Minor impact because of the change in land use from troop cantonment to community facility.	No impact.
Population	Minor impact because project will increase population slightly.	Minor impact because project will increase population at Fort Belvoir by 206 employees.
Housing	No impact.	No impact.
Employment	Minor impact because project will increase employment slightly.	Minor impact because project will increase employees at Fort Belvoir by 206 employees.
Community & Army Facilities	Will mitigate effects of BRAC (Cameron Station closure).	No impact.
Traffic & Transportation	Minor impact because project will increase local traffic.	Minor impact because project will increase local traffic.
Cultural Resources	Needs Phase I survey.	No impact.
Hazardous Materials	No impact, even though project will have underground storage tanks (fuel oils, degreasers).	No impact because asbestos in building will be removed before renovation.

*All numbers for personnel in this table are subject to fluctuations and are therefore approximate.

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Table S-5
SUMMARY OF CUMULATIVE EFFECTS OF PROPOSED BRAC ACTIONS AT FORT BELVOIR

Resource	Effect
Physiography & Topography	Minor impact, final site designs will minimize cut and fill.
Geology & Groundwater	No impact.
Soils	Minor impact because BRACs 2, 3, 5, 6, and 8 contain soils that may present engineering constraints that could affect site layout.
Surface Water	Minor impact because BRACs 1 and 3 will require culverts.
Climate & Air Quality	No impact.
Wildlife Genetic Corridor	Minor impact because the buffer at BRAC 1 and the box culverts at BRAC 3 will minimize the effects of these projects.
Game Species	Same as above
Wetlands	Minor effects expected. Approximately 2.8 acres of wetlands will be affected by these projects. Wetlands will be constructed on other areas of the post.
Aquatic Biota	Minor temporary construction impacts will occur at BRAC 3; best management practices will be used to minimize downstream sedimentation.
Threatened & Endangered Species	Minor effects expected. A survey for wood turtles will be completed along the entire right-of way for BRAC 3. Box culverts in road design will allow safe movement of wildlife.
Land use	No impact.
Population	Minor impact because of a net increase of 18% (3,856 people) on post.
Housing	No impact.
Employment	Minor impact because of an increase of 24% (3,856 employees) on post.
Community & Army Facilities	Minor impacts are expected because of the proposed BRAC projects. Solid waste generation will increase by approximately 18% (7.42 tons per day). All of the eligible BRAC projects will be included in the post-wide recycling program. BRACs 5, 6, and 9 will mitigate closure of similar facilities at Cameron Station.
Traffic & Transportation	Major impacts even though BRAC 3 will mitigate for BRACs 1 and 2 locally. BRACs 1, 2, 4, 5, 6, 7, 8, 9, and 10 will increase traffic around the post. The Army will coordinate its traffic improvement plans with state and local highway departments to mitigate the regional transportation impacts generated by both the Army and local growth. The improvements will include the addition of left- and right-turn lanes, traffic signals or signal upgrades, and additional lanes or participation in new highway projects.
Cultural Resources	All surveys will be completed before construction begins, as a result, no impacts are expected.
Hazardous Materials	No impacts are expected because the minimal amounts of hazardous wastes that are generated or stored at BRACs 1, 2, and 8, and the asbestos encountered during the completion of BRACs 7 and 10 will be handled according to regulations. BRAC 9 will have underground storage tanks.

*All numbers for personnel in this table are subject to fluctuations and are therefore approximate.

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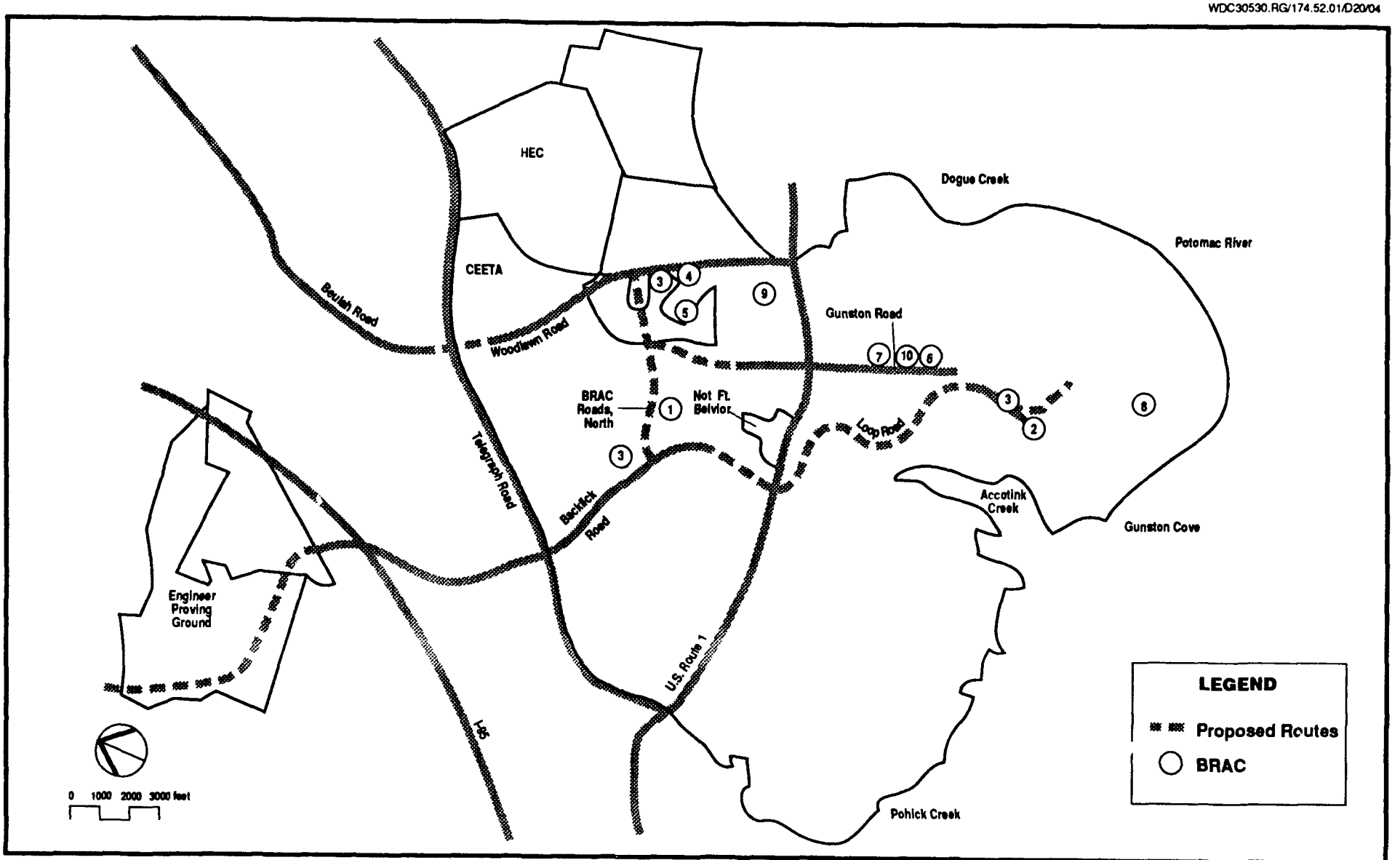


Figure S-2
Locations of Fort Belvoir BRAC Sites

Table S-6
COMPLIANCE WITH ENVIRONMENTAL QUALITY PROTECTION STATUTES AND OTHER ENVIRONMENTAL REVIEW REQUIREMENTS FOR BASE CLOSURE ACTIONS, MDW

Installation	Proposed Action	Historic Preservation Acts	Clean Air Act	Clean Water Act & CBPA	Endangered Species Act	Harbors, Scenic River Acts	Watershed Protection Act	E.O. 11988, Floodplain Management	E.O. 11990, Wetlands Protection	RCRA
Cameron Station	Closure	1	Complies	Complies	1	Complies	Complies	Complies	Complies	Complies
Fort Belvoir	Headquarters Complex	1	Complies	Complies	1	Complies	Complies	Complies	Complies	Complies
	Industrial Park	1	Complies	Complies	1	Complies	Complies	Complies	Complies	Complies
	BRAC Roads	1	Complies	2	1 and 2	2	2	2	2	2
	Commissary Warehouse Addition	1	Complies	Complies	1	Complies	Complies	Complies	Complies	Complies
	Post Exchange	1	Complies	Complies	1	Complies	Complies	Complies	Complies	Complies
	Commissary	1	Complies	Complies	1	Complies	Complies	Complies	Complies	Complies
	Administration Facility	1	Complies	Complies	1	Complies	Complies	Complies	Complies	Complies
	Material Research Facility	1	Complies	Complies	1	Complies	Complies	Complies	Complies	Complies
	Exchange Branch	1	Complies	Complies	1	Complies	Complies	Complies	Complies	Complies
	Modify Buildings 1466 & 1445	1	Complies	Complies	1	Complies	Complies	Complies	Complies	Complies
	ISC Personnel Realignment	Complies	Complies	Complies	Complies	Complies	Complies	Complies	Complies	Complies
Fort Myer	DOL	1	Complies	Complies	1	Complies	Complies	Complies	Complies	Complies
	Commissary	1	Complies	Complies	1	Complies	Complies	Complies	Complies	Complies
	PX Expansion	1	Complies	Complies	1	Complies	Complies	Complies	Complies	Complies
	Shoppette	1	Complies	Complies	1	Complies	Complies	Complies	Complies	Complies
Fort McNair	MDW Information Management Personnel Realignment	Complies	Complies	Complies	Complies	Complies	Complies	Complies	Complies	Complies

Legend:
E.O. = Executive Order
CBPA = Chesapeake Bay Preservation Act
1 = Coordination in process, full compliance anticipated
2 = Detailed studies in process, full compliance anticipated

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The realignments will increase the population at Fort Myer by 192 people. This additional population will increase the amount of solid waste generated at the post. The increased solid waste will be mitigated by including the new activities in Fort Myer's post-wide recycling program. The increased population will require additional parking areas on post and may require that some on-post roads be upgraded.

The solvents, fuels, battery acids, greases, and oils generated and stored by the logistics complex will be handled in accordance with all applicable county, state, and federal regulations.

Table S-7 presents a summary of the effects of the proposed BRAC actions at Fort Myer.

Realignment of Activities to Fort McNair

The realignment of two people to Fort McNair will not have any significant adverse effect on any resource.

Fort Belvoir Concept Development Plan

Several of the CDP projects planned at Fort Belvoir have the potential to affect physical, biological, and cultural resources. The analysis of the effects of these projects on resources at Fort Belvoir has been limited to the preliminary sites presented in this document and is included to provide, to the extent possible, a cumulative context for the BRAC projects. This EIS is not the decision document for the CDP projects. The cumulative environmental analyses and documentation for these projects will be included in the Master Plan and its associated EIS. These analyses could result in one or more of the CDP projects being re-sited. The following discussion of the effects of the Fort Belvoir CDP projects includes only those resources that appear to be adversely affected at this time.

Soils

Several facilities have been proposed for areas where soil may present building constraints. Hydric soil, high water tables, and steep slopes may impose both physical and regulatory constraints on development. Site-specific subsurface investigations will be necessary before the final design is developed for those facilities. Even the sites that are not identified as having soil that could constrain site configuration and design could affect the environment. Grading and excavation will make sediments more susceptible to erosion and dispersal by wind and surface water runoff. BMPs and a regional stormwater-management system will be used to control erosion.

Table S-7
SUMMARY OF EFFECTS OF PROPOSED BRAC ACTIONS AT FORT MYER*

Resource	Commissary Effect	Shoppette Effect
Physiography & Topography	Minor impact because final site design will minimize cut & fill.	Minor impact because final site design will minimize cut & fill.
Geology & Groundwater	No impact.	No impact.
Soils	Subsurface investigations needed to determine impact.	Subsurface investigations needed to determine impact.
Surface Water	Minor impact because stormwater runoff will increase. This will be mitigated by a stormwater management plan.	No impact.
Climate & Air Quality	No impact.	No impact.
Wildlife Genetic Corridor	No impact.	No impact.
Vegetation	No impact.	No impact.
Wildlife	No impact.	No impact.
Game Species	No impact.	No impact.
Wetlands	No impact.	No impact.
Aquatic Biota	No impact.	No impact.
Threatened & Endangered Species	No impact.	No impact.
Land Use	Minor impact because project will change land use from open space to community facilities.	Minor impact because project will change land use from open space to community facilities.
Population	Minor impact because project will increase population at Fort Myer by 28 employees.	Minor impact because project will increase population at Fort Myer slightly.
Housing	No impact.	No impact.
Employment	Minor impact because project will increase employment by 28.	Minor impact because project will increase employment at Fort Myer slightly.
Income	No impact.	No impact.
Community & Army Facilities	Minor impact because a project will increase demand on some facilities; will increase generation of solid waste somewhat, will participate in recycling program.	Minor impact because project will increase demand on some facilities; will increase generation of solid waste somewhat, will participate in recycling program.
Traffic & Transportation	Minor impact because additional parking areas needed, onpost road upgrades may be required.	Minor impact because additional parking areas needed, onpost road upgrades may be required.
Cultural Resources	Impacts will be minimal because Phase I survey will be completed on the site.	Impacts will be minimal because Phase I survey will be completed on the site.
Hazardous Materials	No impact because minimal amounts will be generated and disposed of according to regulations.	No impact.

*All numbers for personnel in this table are subject to fluctuations and are therefore approximate.

Table S-7
SUMMARY OF EFFECTS OF PROPOSED BRAC ACTIONS AT FORT MYER*

Resource	Post Exchange Expansion Effect	Logistics Complex Effect
Physiography & Topography	Minor impact because final site design will minimize cut & fill.	Minor impact because final site design will minimize cut & fill.
Geology & Groundwater	No impact.	No impact.
Soils	Subsurface investigations needed to determine effects.	Subsurface investigations needed to determine effects.
Surface Water	No impact.	Minor impacts because surface-water runoff will increase. This will be mitigated by a stormwater management plan.
Climate & Air Quality	No impact.	No impact.
Wildlife Genetic Corridor	No impact.	No impact.
Vegetation	No impact.	No impact.
Wildlife	No impact.	No impact.
Game Species	No impact.	No impact.
Wetlands	No impact.	No impact.
Aquatic Biota	No impact.	No impact.
Threatened & Endangered Species	No impact.	No impact.
Land Use	Minor impact because project will change land use from open space to community facilities.	No impact.
Population	Minor impact because project will increase population at Fort Myer slightly.	Minor impact because project will increase population at Fort Myer by 161 employees.
Housing	No impact.	No impact.
Employment	Minor impact because project will increase employment at Fort Myer slightly.	Minor impact because project will increase employment at Fort Myer by 161 employees.
Income	No impact.	No impact.
Community & Army Facilities	Minor impact because project will increase demand on some facilities; will increase generation of solid waste somewhat, will participate in recycling program.	Minor impact because project will increase demand on some facilities; will increase generation of solid waste somewhat, will participate in recycling program.
Traffic & Transportation	Minor impact because additional parking areas needed, onpost road upgrades may be required.	Minor impact because additional parking areas needed, onpost road upgrades may be required.
Cultural Resources	Impacts will be minimal because a Phase I survey will be completed on the site.	Impacts will be minimal because a Phase I survey will be completed on the site.
Hazardous Materials	No impact.	Minor impacts because multiple solvents, fuels, battery acids, greases, and oils will be handled in accordance with all applicable county, state, and federal regulations.

*All numbers for personnel in this table are subject to fluctuations and are therefore approximate.

Surface Waters

Tompkins Basin Armed Forces Recreation Area (NAF 2) has the potential for affecting the quality of surface water because of the proposed shoreline development and channel dredging for the marina. The effects caused by the remaining sites associated with surface water will be minimized by observing required buffer areas. The BMPs used to control erosion will also help protect the quality of surface water.

Genetic Corridor

A genetic corridor is a band of native vegetation between large areas of habitat that allows the movement of animals between the habitat areas. In addition, genetic corridors enable species with large home range requirements to populate areas, which would not otherwise occur (Redford and Fonseca, 1986). If constructed, the 1,500 housing units (AFH 3) are expected to have the greatest effect on the wildlife genetic corridor. Site development would virtually eliminate all of the remaining unfenced wooded corridor. Several other facilities will also have an effect on this corridor: the Old Guard Horse Stables (MCA 10), the Golf Course (NAF 5), the Defense Reutilization and Marketing Office (MCA 36), and the Ammunition Storage Facility (MCA 25).

The extension of Gunston Road (MCA 16) could also have a detrimental effect on the dispersal of species across the roadways.

It will be important to maintain a contiguous buffer of native vegetation throughout the corridor that will allow wildlife to pass freely between the wildlife refuges that are north and south of the installation. Suitable alignments and widths for the buffer will be adopted from Fort Belvoir's Natural Resources Management Plan.

Vegetation

AFH 3 and NAF 5 will require the clearing of large amounts of vegetation. Fort Belvoir will comply with Fairfax County's tree preservation ordinance. The objective of the ordinance is to retain canopy areas on development sites to minimize fragmentation. A significant beautification program, including planting trees and landscaping throughout Fort Belvoir, has been conducted and will continue for these projects.

Wildlife

Increased use of herbicides and pesticides to maintain NAF 5 could lead to increased animal mortality. However, Fort Belvoir will develop an EPA-reviewed, integrated pest management program to minimize the effects of the herbicides, fungicides, and pesticides used on the golf course. Overall, competition for food

and territories may increase as animals are displaced by construction activities, resulting in stressed populations. As part of the Natural Resources Development Plan, Fort Belvoir will undertake an integrated protection program for wildlife habitat. Brush shelters will be used to enhance wildlife habitat and to restore disturbed sites.

Wetlands

Large areas of wetlands are associated with AFH 3 and NAF 5, which may significantly reduce the scope of the proposed projects. In addition, the Fixed-Wing Runway Extension (MCA 9); Headquarters, U.S. Air Force Intelligence (MCA 13); Virginia National Guard Armory/Headquarters (MCA 15); MCA 16; D.C. Army National Guard Academy (MCA 21); EPG Test/Storage Facilities (MCA 24); D.C. Army National Guard Cantonment Area (MCA 28); Loop Road (MCA 31); MCA 36; and the 500-person Administrative Facility (MCA 42) either have wetlands on the site or are affected by the Resource Protection Area (RPA) boundaries required for wetlands located off the site.

Fort Belvoir, or the appropriate tenant, will secure a Clean Water Act Section 404 wetlands permit for activities in wetlands that require permits. Where required, wetlands will be enhanced, restored, or created to compensate for affected wetlands. The objective will be no net loss of wetland habitat.

Aquatic Biota

NAF 2 has the potential for having effects, particularly on Gunston Cove biota. In addition, the dredging required for NAF 2 and the Reserve Center/OMA (MCA 38) will have a temporary negative effect on the aquatic biota of Gunston Cove. Runoff of pesticides and herbicides from NAF 5 may affect aquatic biota. Aquatic species will also be affected by surface particulates, nutrients, or other pollutants of water quality. BMPs will be used to control runoff and to reduce soil erosion.

Threatened and Endangered Species

Boat traffic from both MCA 38, and NAF 2, could affect three nesting pairs of federally listed endangered bald eagles in the area. Fort Belvoir will prepare an eagle management plan, as part of the Natural Resource Management Plan, which will outline the steps required to minimize the effects of boat traffic on the birds. This plan may require that boating and other similar activities be curtailed in parts of Gunston Cove at critical times during the year.

Construction of AFH 3 may affect a population of wood turtles, a species that is a candidate for listing by the state as a threatened species. Site-specific surveys will be completed during the design phase of this project to determine the critical habitat requirements of the turtles on the site. Additional coordination with appropriate agencies will also be completed at that time.

Under the Natural Resources Management Plan, protection strategies will be developed to minimize effects on these and other protected species on the post. CDP sites will require adjustment if the threatened or endangered species are at risk.

Community and Army facilities

The CDP projects will include infrastructure to offset the demand on existing facilities created by the proposed population increase. However, these effects will be mitigated by the proposed construction of new infrastructure and Army facilities at Fort Belvoir, which will be consistent with the current Fort Belvoir Land Use Plan.

Traffic and Transportation

Traffic volumes on area roadways will increase above baseline levels. Additional highway construction and realignments, beyond what is currently needed to ease the existing traffic congestion, will be necessary to meet the increase in traffic volume and the change in traffic patterns. Improvements will be funded as agreed by VDOT, Fairfax County, and the U.S. Army.

Cultural Resources

NAF 2 has the potential for directly affecting an archeological site eligible for the National Register of Historic Places. Several other projects may affect sites that require further evaluation. Direct effects will be prevented by detailed site design. In areas where Phase I (investigative) surveys have not been completed, the surveys will be completed before construction begins, as will the coordination under Section 106 of the National Historic Preservation Act (NHPA).

Renovations of historic buildings or construction in the Historic District must be compatible with the architecture of the district. Several projects will require standing-structure surveys and will have design constraints because of their siting either within or next to the Historic District. The structures include the Operations Building Renovations (MCA 7); North Post Fire Station (MCA 12); Physical Fitness Center (MCA 14); warehouses (MCA 34); Consolidated Maintenance Shop (MCA 39); and Belvoir Village Whole-House Renewal (AFH 7), Gerber Village Whole-House Renewal (AFH 8), and Jadwin Loop Whole-House Renewal (AFH 10).

All historic properties will be identified and the effects of BRAC undertakings will be considered in accordance with NHPA, Section 106. This will be done after considering the comments of the Virginia State Historic Preservation Office and the Advisory Council on Historic Preservation about the location, design, and construction of the facilities.

Hazardous Materials

Because many of the CDP projects are still in the planning stage, determining the specific effects of hazardous materials is difficult. Activities that will require handling, storing, or disposing of hazardous materials will be required to comply with federal and state regulations and Fort Belvoir's spill prevention, containment, and control plan.

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LIST OF ACRONYMS AND ABBREVIATIONS

AAFES	Army and Air Force Exchange Services
AFH	Army Family Housing
AMC	Headquarters, U.S. Army Materiel Command
AMTL	Army Material Technology Laboratory
AQCR	Air Quality Control Region
BATES	Biological Assessment of Threatened and Endangered Species
BMP	best management practice
BRAC	base realignment and closure
BRDEC	Belvoir Research Development Engineering Command
CDP	Concept Development Plan (Fort Belvoir)
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CIDC	Criminal Investigation Command
CO	carbon monoxide
DAPC	Virginia Department of Air Pollution Control
DCAA	Defense Contract Audit Agency
DCSLOG	Deputy Chief of Staff for Logistics
DEH	Directorate of Engineering and Housing
DLA	Defense Logistics Agency
DOD	Department of Defense
DOL	Directorate of Logistics
DRMO	Defense Reutilization and Marketing Office in base section
EBS	Environmental baseline study
EIFS	Economic Impact Forecast System
EIS	environmental impact statement
EPA	U.S. Environmental Protection Agency
EPG	Engineer Proving Grounds
EQC	Environmental Quality Corridor
FCWA	Fairfax County Water Authority
gal/min	gallons per minute
gpd	gallons per day
gpm	gallons per minute
GSA	General Services Administration
HEC	Humphreys Engineer Center
HOV	high-occupancy vehicles
HQUSACE	Headquarters, U.S. Army Corps of Engineers
ISC	Information Systems Command
ISEC	Information Systems Engineering Command
IWR	Institute for Water Resources
JPPSPOWA	Joint Personal Property Shipping Office, Washington Area
lb/hr	pounds per hour
LOS	level-of-service

LPPCP	Lower Potomac Pollution Control Plant (Fairfax County)
MACOM	Major Command
MAI	MAAR Associates, Inc.
MCA	Military Construction Activity
MDW	Military District of Washington
mgd	million gallons per day
MOA	Memorandum of Agreement
MSA	Washington, D.C., Metropolitan Statistical Area
MSL	mean sea level
MSW	municipal solid waste
MY Plan	Multi-Year Plan
NAF	Non-Appropriated Funds
NCO	Noncommissioned Officer
NCR	National Capital Region
NEPA	National Environmental Policy Act of 1969
NHPA	National Historic Preservation Act of 1966
NO_2	nitrogen dioxide
NOV	notice of violation
NRHP	National Register of Historic Places
O_3	ozone
PA	Preliminary Assessment
PCBs	polychlorinated biphenyls
PEPCO	Potomac Electric Power Company
ppm	parts per million
PX	post exchange
RCRA	Resource Conservation and Recovery Act
REC	Record of Environmental Consideration
RI	Remedial investigation
RI/FS	Remedial investigation/feasibility study
RMA	Resource Management Area
ROD	Record of Decision
RPA	Resource Protection Area
SARA	Superfund Amendments and Reauthorization Act
SHPO	State Historic Preservation Office
SO_2	sulphur dioxide
SPCC	Spill Prevention, Control, and Countermeasures
SWCB	Virginia State Water Control Board
TSP	total suspended particulates
µg/l	micrograms per liter
USAEHA	U.S. Army Environment and Hygiene Agency
USATHAMA	U.S. Army Toxic and Hazardous Materials Agency
UST	underground storage tank
VDOT	Virginia Department of Transportation

Chapter 1.0
INTRODUCTION

1.1 BASE REALIGNMENT AND CLOSURE

The Defense Secretary's Commission on Base Realignments and Closures, the Commission, was chartered on May 3, 1988, by the Secretary of Defense to recommend military installations within the United States, its commonwealths, territories, and possessions for realignment and closure. Subsequently, the Defense Authorization Amendments and Base Closure and Realignment Act (P.L. 100-526, October 24, 1988) required the Secretary of Defense to implement the Commission's recommendations unless he rejected them in their entirety or the Congress passed, and the President signed, a joint resolution disapproving the Commission's recommendations.

The primary criterion used by the Commission for identifying candidate installations was the military value of the installation. However, cost savings were also considered, as were the current and projected plans and requirements for each military service. Lastly, the Commission focused its review on military properties and their uses, not military units or organizational or administrative issues.

On December 29, 1988, the Commission recommended changes at 145 military installations. Of this number, 86 are to be closed, five are to be closed in part, and 54 are to be changed, either an increase or decrease, as units and activities are relocated.

On January 5, 1989, the Secretary of Defense approved these recommendations and announced that the Department of Defense would implement them. The Congress did not pass a joint resolution disapproving the recommendations within the time allotted by the Act.

Therefore, the Act now requires the Secretary of Defense, as a matter of law, to implement these base realignments and closures (BRACs). Implementation must be initiated by September 30, 1991, and must be completed no later than September 30, 1995.

In accordance with its mandate, the Commission recommended Cameron Station for closure, largely because of a substantial lack of administrative space and problems with security, maintenance, electrical equipment, health, and safety related to its old and inefficient facilities. The Commission recommended in *Base Realignments and Closures Report of the Defense Secretary's Commission, December, 1988,* that the major activities at Cameron Station be relocated to Fort Belvoir, Virginia, which is within commuting distance. The Commission also recommended closure of the Army Material Technology Laboratory (AMTL) in Watertown, Massachusetts, and partial closure of Fort Meade and Fort Holabird, Maryland, with the realignment of those affected activities to Fort Belvoir. Information Systems Command (ISC) is to be realigned to Fort

Devens, Massachusetts, from Fort Belvoir, Fort Huachuca, and Fort Monmouth. The areas vacated by ISC at Fort Belvoir will be used for Criminal Investigation Command (CIDC) activities transferred from Fort Meade, Fort Holabird, and leased space in northern Virginia. The closure issues at the Massachusetts and Maryland facilities and the relocation of ISC activities to Fort Devens are addressed in separate environmental impact statements (EISs). Realignment of activities from these facilities to Fort Belvoir, Fort Myer, and Fort McNair is addressed in this study.

1.2 CONCEPT DEVELOPMENT PLAN

Realignments to Fort Belvoir because of base closures, the relocation of the Army Engineer School to Fort Leonard Wood, and the continued interest in Fort Belvoir as an administration center, have increased the need for planning growth at Fort Belvoir in a sound manner. Therefore, a Concept Development Plan (CDP) is being prepared to reflect the realignment actions as well as other future growth. The Fort Belvoir Master Plan will be revised to include the CDP, and appropriate National Environmental Policy Act (NEPA) analysis, beginning in fiscal year 1991.

Potential sites have been identified by Army planners for many of the projects proposed at Fort Belvoir. The alternatives for these CDP projects include changes in final siting, as well as the timing of project initiation. An evaluation of environmental constraints will be used to determine the actual locations of structure "footprints" for the proposed actions. To date, the CDP has shown the proposed locations for these projects. The site location and the "footprint" within the site could change if the new site is compatible with the land use plan at Fort Belvoir. Detailed NEPA documentation will be prepared for each of these actions, if appropriate, when they are nearer to completion.

Many of the projects discussed as part of the CDP are part of the Military District of Washington (MDW) Multi-year Plan (MY Plan). Projects on the MDW MY Plan have been approved by the Major Command (MACOM) for Fort Belvoir and have funding mechanisms in place through fiscal year 1997. In addition to the Fort Belvoir MACOM-approved projects, there are projects shown on the CDP that are either approved plans for other MACOMs (e.g., Army, National Guard, and CIDC) and other services or are projects that are currently planned and considered to be needed at Fort Belvoir.

1.3 PURPOSE AND SCOPE OF THE EIS

This EIS is being prepared in accordance with the provisions of NEPA, Army Regulation 200-2 (Environmental Effects of Army Actions), and the Council on Environmental Quality (CEQ) (40 CFR, Part 1500). NEPA provisions apply to two phases of the BRAC process:

- After the installation to be closed (or the activity to be realigned) is chosen, but before realignment and closure activities commence
- During the process of relocating functions to a receiving installation

The P.L. 100-526 dictates, however, that documents for base closure need not consider:

- The need for realigning or closing a military installation that has been selected for realignment or closure by the Commission
- The need for transferring functions to another military installation that has been selected as the receiving installation
- Alternative military installations to those selected (Section 204 (c) (2))

The primary purpose for this EIS is to identify the environmental impacts and adverse consequences of realignment and closure. The scope of this analysis is comprehensive in its inclusion of the social, economic, and environmental effects the closure of Cameron Station and the realignment of activities to Fort Belvoir and Fort Myer, Virginia, as well as Fort McNair, Washington, DC (Figure 1-1). The EIS also addresses the realignment of activities to Fort Belvoir from the AMTL in Massachusetts and from Fort Meade and Fort Holabird in Maryland, and the relocation of the ISC activities from Fort Belvoir. In addition, the EIS addresses the relocation of CIDC activities, and Defense Logistics Agency (DLA) and other Department of Defense activities from leased space within the National Capital Region (NCR) to Fort Belvoir, and the relocation of non-appropriated funds (NAF) and contractor personnel from Cameron Station to Fort Belvoir and Fort Myer. Environmental implications of reuse options at Cameron Station, to the extent that such options can be foreseen at this time, are also addressed. The proposed locations of the base-closure-related construction actions at Fort Belvoir are shown in Figure 1-2. Site-specific decisions on all proposed construction actions will be supported by subsequent NEPA analyses

The second major activity addressed in this EIS is the Fort Belvoir Concept Development Plan and its associated regional transportation plan. The CDP proposes more than 60 projects at Fort Belvoir through the year 2000 (Figure 1-2) (Keyes Condon Florance, et al. 1990). The analysis of the Concept Development Plan in this EIS focuses on the cumulative effects of future growth as projected in the CDP and considers existing and recent development activities. In addition, some agencies are consolidating activities currently in leased space with those being relocated to Fort Belvoir as part of P.L. 100-526. Further environmental impact analysis will be provided to accompany the Master Plan currently being prepared.

Special legislation approving a public-private development initiative for the Engineer Proving Grounds (EPG), the western portion of Fort Belvoir, opened the way for a

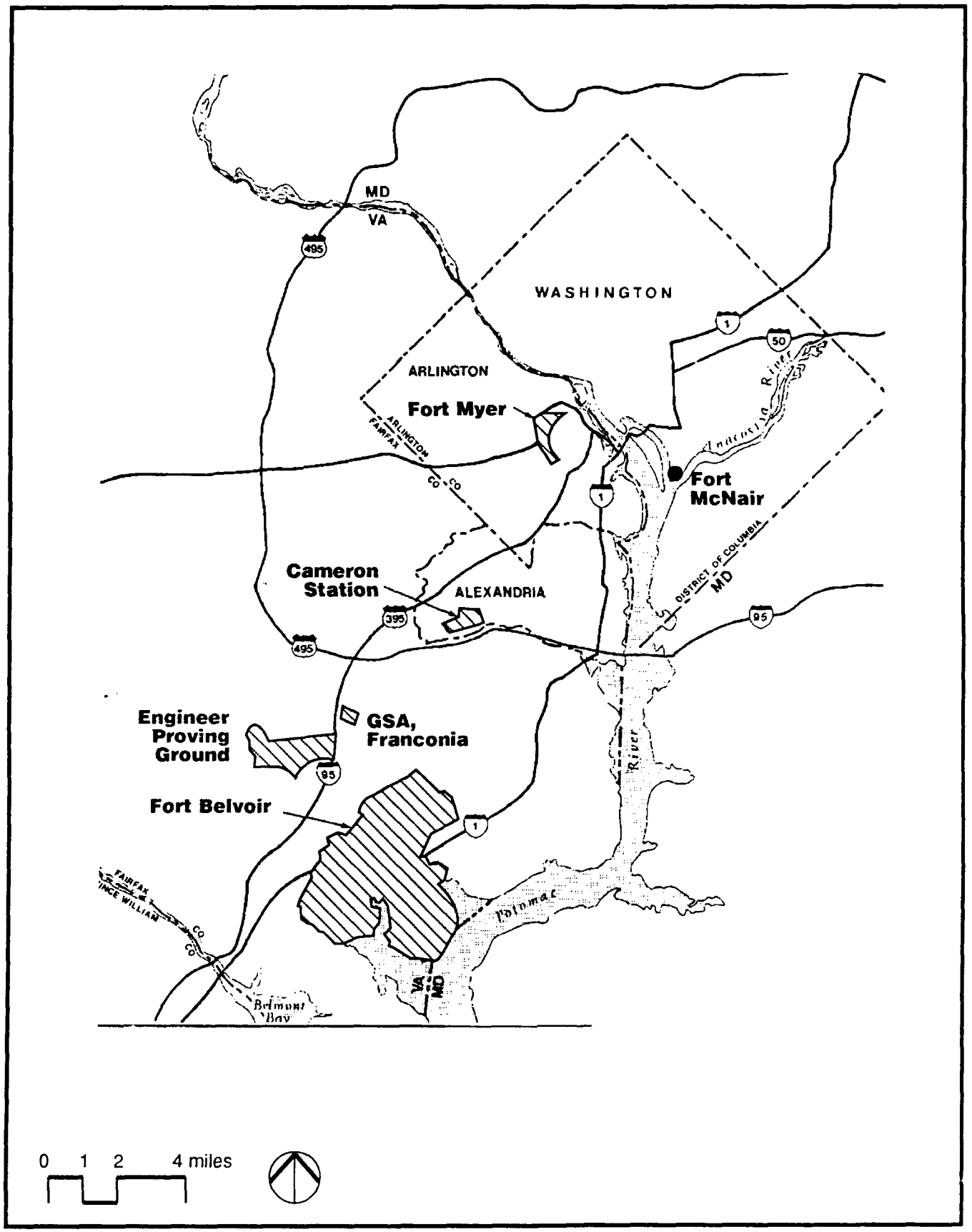


Figure 1-1
Project Area

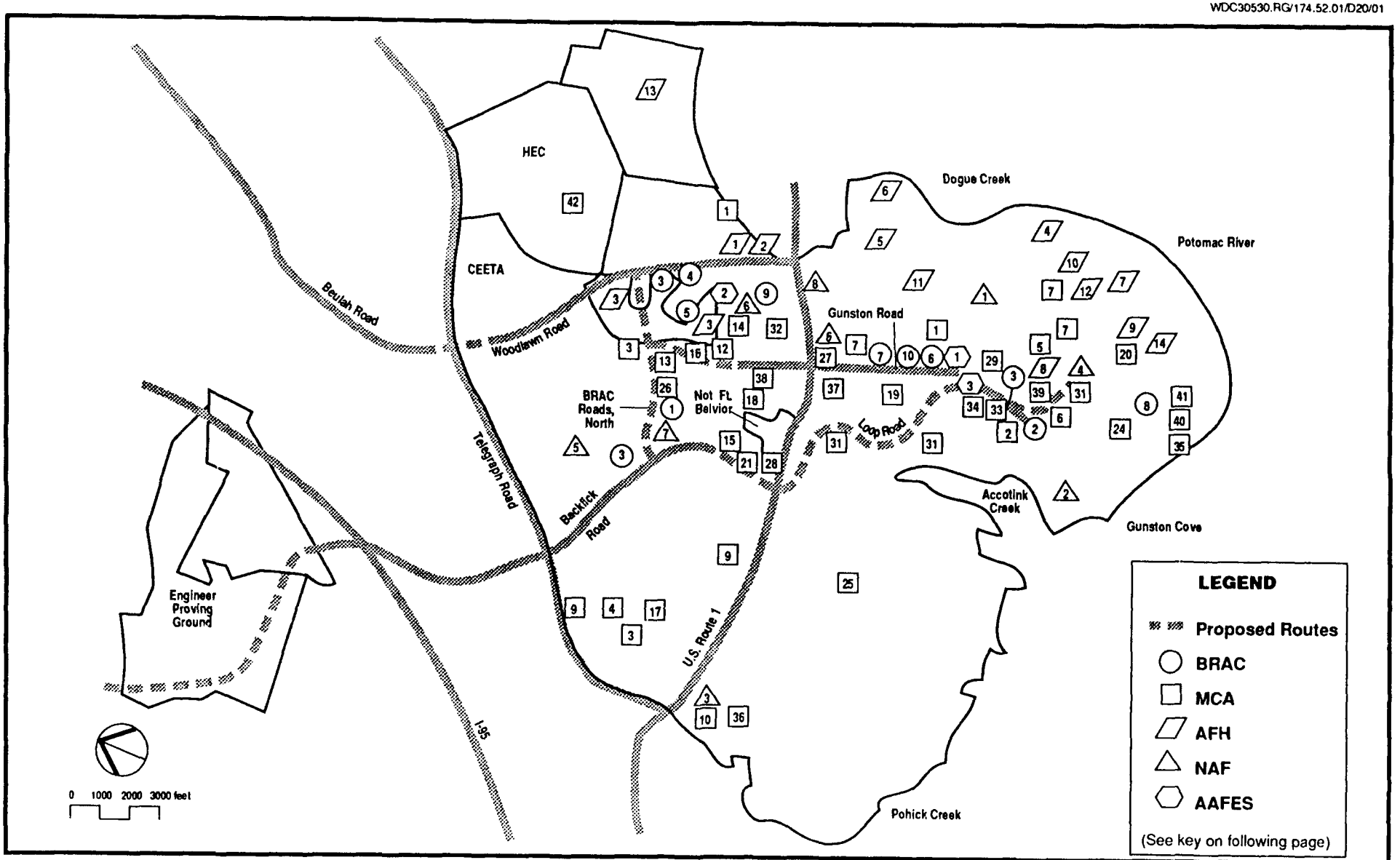


Figure 1-2
Locations of Fort Belvoir BRAC and Concept Development Plan Sites

Key to Figure 1-2
LOCATIONS OF FORT BELVOIR BRAC AND DEVELOPMENT PLAN SITES

Base Realignment and Closure (BRAC) Actions

1. Headquarters Complex
2. Industrial Park
3. BRAC Roads
4. Commissary Warehouse Addition*
5. Post Exchange
6. Commissary
7. Administration Facility (1465)
8. Material Research Facility
9. Exchange Branch
10. Modify Buildings 1466 and 1445 for Base Closure

Concept Development Plan Actions

Military Construction Activity (MCA)**

1. Child Development and Religious Education Centers
2. Electronics Supply and Maintenance Facility
3. D.C. Army National Guard Armory
4. D.C. Army National Guard Aircraft Parking Apron
5. Convert Buildings 206 and 208 to Classrooms
6. Veterinary Clinic
7. Operations Building Renovation, Engineer School Backfill
8. Telephone Switch Upgrade, Post-wide
9. Fixed-Wing Runway Extension
10. Old Guard Horse Stables
11. Main Sewer Line Upgrade, Post-wide
12. North Post Fire Station
13. Headquarters, Air Force Intelligence Agency
14. Physical Fitness Center
15. Virginia Army National Guard Armory/Headquarters (29th Light Infantry Division)
16. Gunston Road Extension
17. D.C. Army National Guard Hangar Addition
18. Seabee Operational Storage Facility
19. Renovate Heat Plant
20. Renovate Building 361 for ADP
21. D.C. Army National Guard Academy
22. Electrical Upgrade, Post-wide, Phase I
23. Lateral Sewer Line Repair, Post-wide
24. Relocate EPG Test/Storage Facilities
25. Ammunition Storage Facility
26. Information Systems Facility
27. CIDC Field Operations Building
28. D.C. Army National Guard Cantonment Area
29. Main Post Library
30. (There is no MCA 30)
31. Loop Road
32. Community Center/Welcome Center
33. Facility Engineer Maintenance Shop
34. Warehouses
35. Tactical Energy Systems Lab
36. Conforming Storage Building (DRMO)
37. Military Police Station
38. Reserve Center/OMA (80th Div)
39. Consolidated Maintenance Shop (DOL)
40. Electro-Optics Laboratory
41. Fatigue Test Facility
42. Potential 500-person Administrative Facility, HEC

Non-Appropriated Funds (NAF)

1. Youth Center
2. Tompkins Basin Armed Forces Recreation Area
3. Horse Stables
4. Benyuard Pool Addition
5. Golf Course
6. Corporate Fitness Center
7. Child Development Center
8. Temporary Lodging Facility

Army and Air Force Exchange Services (AAFES)

1. Fast Food Facility (Burger King™)
2. Fast Food Facility (Chicken)
3. Car Care Facility

Army Family Housing (AFH)

1. Lewis Heights Renewal, Phase 1
2. Lewis Heights Renewal, Phase 2
3. 1,500 NCO Housing Units (New)
4. Dogue Creek Village Whole-House Renewal
5. George Washington Village Whole-House Renewal
6. River Village Whole-House Renewal
7. Belvoir Village Whole-House Renewal
8. Gerber Village Whole-House Renewal
9. Visiting Officers' Quarters Renovation
10. Jadwin Loop Whole-House Renewal
11. Colyer Village Whole-House Renewal
12. Rossell Loop Whole-House Renewal
13. Woodlawn Village Whole-House Renewal
14. Fairfax Village Whole-House Renewal

*Authorization and funding for this project has been withdrawn. It is included for informational purposes because it was part of the original scope.
**MCA in this context is not a funding appropriation.

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proposed mixed-use development on this 820-acre[1] parcel. Approximately 3 million square feet of administrative office space will be built for the Army in exchange for the right to develop the remainder of the property. A separate EIS is being prepared for this action. However, information concerning the EPG is included in this EIS to show cumulative effects.

Two large development projects originally scheduled for the Fort Belvoir area, Headquarters, U.S. Army Material Command (AMC) and Headquarters, U.S. Army Corps of Engineers (HQUSACE), are no longer planned for their original proposed sites. The AMC facility, originally planned for a site on North Post, is currently planned to be included in the EPG development. The HQUSACE facility, originally planned at the Humphreys Engineer Center (HEC), has not been resited. The AMC development is addressed in detail in the EIS for the EPG development and is mentioned here for informational purposes only. The HQUSACE facility is not specifically addressed in either this EIS or the EPG EIS because it is not under consideration for development within the regions covered by either EIS.

Similarly, the General Services Administration (GSA) had announced plans to redevelop a 70-acre parcel at Franconia near Springfield, Virginia. During the scoping for the Fort Belvoir EIS this parcel was identified as a potential project needing its own environmental impact analysis. The project was to be analyzed in this EIS for its cumulative effects on Fort Belvoir. GSA, however, has since dropped plans to redevelop the parcel. Therefore, the GSA project is not included in the cumulative effects addressed in this EIS.

1.4 SCOPING OF THE EIS

Environmental issues relevant to the realignment and closure of Cameron Station, the realignment to Fort Belvoir of other Army functions, and the Fort Belvoir CDP were solicited from the public and government agencies and representatives in the summer and the fall of 1989. The CDP will provide the basis for updating the Fort Belvoir Master Plan. The scoping process began with the transmittal of a notice of intent to prepare the Fort Belvoir EIS, published in the *Federal Register* on June 23, 1989. Public notices describing the proposed action and announcing two public meetings were published in local newspapers and were also mailed to U.S. Environmental Protection Agency (EPA), Region III (NEPA Compliance Section and the Regional Administrator), the U.S. Fish and Wildlife Service (Regional Director), U.S. Soil Conservation Service, the National Marine Fisheries Service, Commonwealth of Virginia, local city and county officials, and to various public and civic organizations and individuals.

[1]All numbers for acreage, square footage, and personnel within this EIS are subject to slight fluctuations and are therefore approximate.

Public scoping meetings were held at Hayfield Secondary School in Fairfax County on August 8, 1989, and at Patrick Henry Elementary School in Alexandria on October 16, 1989. Public scoping comments were recorded through the preparation of meeting transcripts. Additional comments were subsequently received in the form of letters, which were accepted even after the end of the established response period (Appendix A).

Written comments were received from the following:

Virginia Council on the Environment
Virginia Chesapeake Bay Local Assistance Department
Virginia Department of Air Pollution Control
Virginia Department of Agriculture and Consumer Services
Virginia Department of Historic Resources
Virginia State Water Control Board
Fairfax County Public Schools
Northern Virginia Planning District Commission
Metropolitan Washington Council of Governments
Fairfax County Board of Supervisors
National Capital Planning Commission
Baker Engineers

1.4.1 IDENTIFIED ENVIRONMENTAL ISSUES

A wide range of issues were identified during project scoping. Several comments dealt with the timing of the Fort Belvoir EIS in relation to the EISs to be prepared for the EPG; for the AMC, which has been resited; and for the GSA Franconia project, which is no longer being considered.

Some of those commenting questioned the "piece-meal" approach. Others expressed concerns that all of the required NEPA issues would be addressed. Traffic and transportation planning were the most frequently discussed issues. Several people wanted to see public transportation options addressed and to be assured that plans would be integrated with public transportation plans wherever possible.

Environmental constraints discussed included wildlife and genetic corridors, development in the Accotink Wildlife Refuge, threatened and endangered species, wetlands, floodplains, soil erosion, steep slopes, the deer population, and maintenance of tree cover. Several comments were also received regarding air quality, and archeological and cultural resources as well as the maintenance of the military history collection at Cameron Station. Socioeconomic impacts at the closing and receiving installations, tax benefits, the tax base, and the fair market value of the land were also issues. Several of those commenting wanted to see that Virginia's new Chesapeake Bay legislation also was addressed, including the effects of erosion controls.

The potential of hazardous wastes being at Cameron Station (e.g., the possible buried transformers containing polychlorinated biphenyls [PCBs] and leaking underground fuel tanks) and the potential of hazardous chemicals being used at the receiving base because of the realignment were concerns. A comment was also received regarding the use of pesticides at Fort Belvoir.

The public was concerned about being kept informed of the Army's plans and how the transfer of information (e.g., through the task forces) would occur. Comments were received requesting that the City of Alexandria be addressed and that a jail not be considered as a reuse at Cameron Station. Public-sector master planning was requested to be coordinated with the preparation of the EIS document.

Public input and information transfer continues through the task forces set up to recommend reuse at Cameron Station. Dialogue will continue among the Army, government agencies, and the general public as the specifics of all the proposed actions proceed. In accordance with P.L. 100-256, installation closures and realignments are to be completed by September 1995.

1.4.2 AGENCY COORDINATION

The Department of the Army initiated agency coordination in the summer of 1989. The coordination was initiated to solicit comments and concerns regarding base closure at Cameron Station, major realignments of activities to Fort Belvoir, minor function realignments to Fort Myer and Fort McNair, and the Concept Development Plan activities at Fort Belvoir. Formal coordination with the U.S. Fish and Wildlife Service under Section 7 of the Federal Endangered Species Act was also initiated by the Army in the form of a Biological Assessment of Threatened and Endangered Species (BATES). The BATES for this project is being coordinated with the appropriate federal and state agencies. Coordination has also been initiated with the National Capital Planning Commission.

1.5 EIS REVIEW AND APPROVAL PROCESS

During the scoping process for this EIS, it was explained that both the draft and final versions of the EIS document would be published, in accordance with CEQ regulations for implementing NEPA, for review and comment by federal, state, and local agencies and by the general public. Notices will be placed in the *Federal Register* each time the document is submitted for public and agency review. The final EIS comprises the draft EIS, public and agency comments on the draft EIS, the Army's response to comments, and any amendments to the EIS that are warranted.

The *Military District of Washington Comprehensive Base Realignment/Closure and Fort Belvoir Development EIS* will result in a Record of Decision (ROD) for the closure of Cameron Station and relocation of its activities to Fort McNair, Fort Myer, and Fort

Belvoir. Also included in this ROD will be the activities realigned to Fort Belvoir from AMTL, Fort Meade, and Fort Holabird, as well as those realigned from Fort Belvoir to Fort Devens.

The ROD for base realignment and closure will be approved and signed by the Assistant Secretary of the Army.

1.6 DEFINITIONS OF CONCEPTS

Concepts defined by Army Regulation 200-2 and CEQ regulations, or derived from them to fit the content of this project, are used throughout this report. Key concepts are defined below.

Alternative Actions: P.L. 100-526 specifies that, in applying the provisions of NEPA to selected installations, the Army shall not have to consider "the need for closing or realigning a military installation...the need for transferring functions to another military installation...or alternative military installations to those selected." Therefore, closure and realignment of Cameron Station, Fort Belvoir, Fort Myer, and Fort McNair are not given further consideration in this document. The only closure and realignment alternatives being considered by the Army are possible implementation alternatives.

Impact Significance: A substantial change in any of the physical or biological resources or socioeconomic conditions within the area affected by the action is considered a "significant impact." A "potentially significant impact" is one that has a reasonable likelihood, but not a certainty, of occurring. It is treated as a significant impact, requiring identification of possible mitigation measures.

Mitigation: "Mitigation" entails the avoidance or the reduction of impacts to acceptable levels. When implementation of the proposed action predicts significant, or potentially significant impacts, mitigation measures are formulated. Mitigation must be feasible and should take into account economic, environmental, legal, social, and technological factors. Mitigation must also have the potential for being accomplished successfully by the Army within a reasonable time frame. The level of significance of impacts, incorporating mitigation measures, is also addressed in the EIS.

Additional terms are defined in Chapter 8.0, Glossary.

Chapter 2.0
ALTERNATIVES, INCLUDING THE PROPOSED ACTIONS

2.1 INTRODUCTION

This EIS addresses base realignment and closure and presents information on the Fort Belvoir Concept Development Plan.

The Defense Secretary's Commission on Base Realignment and Closure recommended the following realignment and closure actions, which will be addressed to some extent in this EIS.

- Closure of Cameron Station and relocation of major activities to Fort Belvoir.
- Partial closure and realignment of Fort Meade and Fort Holabird and the consolidation of CIDC activities at Fort Belvoir.
- Relocation of ISC activities from Fort Belvoir to Fort Devens, and the use of the facilities vacated by ISC at Fort Belvoir for CIDC activities.
- Closure of the AMTL and the relocation of corrosion prevention and control-related research to the Research, Development and Engineering Center at Fort Belvoir. (For the ease of the reader, this research is referred to as AMTL in this EIS.)

Also addressed in this EIS is the relocation of minor activities and NAF and contractor personnel from Cameron Station to Fort Belvoir, Fort Myer, and Fort McNair, and personnel from leased space to Fort Belvoir. The partial closures of Fort Meade and Fort Holabird, relocation of ISC to Fort Devens, and the closure of the AMTL will be addressed in other EISs.

The Fort Belvoir CDP is being developed to direct future growth at the installation. A regional transportation plan is also being prepared in concert with the CDP. Both of these documents provide supporting information for this EIS and are incorporated by reference. The CDP is to be used only for cumulative analyses of BRAC actions. The Fort Belvoir Master Plan will be revised to include the CDP and BRAC activities, along with appropriate NEPA documentation.

2.2 PURPOSE AND NEED

The purpose and need for this EIS are to satisfy the requirements of P.L. 100-526, as described in Chapter 1, for the closure of Cameron Station and the realignment of activities to and from Fort Belvoir, Fort Myer, and Fort McNair. These actions will

result in fiscal savings and mission consolidation for the Army. This EIS provides the environmental impact analysis and documentation for specific BRAC actions and related realignments.

The required Cameron Station closure will result in a relocation of 3,835 authorized personnel[1] from Cameron Station to another workplace. The project will relocate approximately 3,641 of these personnel to Fort Belvoir, 192 to Fort Myer, and two to Fort McNair. The reductions in operations at Fort Meade and Fort Holabird necessitate the movement of approximately 131 people to Fort Belvoir, and the closure of AMTL necessitates the movement of approximately 178 people to Fort Belvoir. In addition, approximately 320 people will be relocated from Fort Belvoir to Fort Devens; NAF and contractor personnel from Cameron Station will be moved to Fort Belvoir and Fort Myer.

In addition to complying with the statutory closure requirements, the base realignment and closure will reduce overall costs through a more efficient military base structure. After consideration of siting and no-action alternatives, 10 Fort Belvoir and four Fort Myer preferred alternatives have been identified that are directly related to the realignment.

2.3 ALTERNATIVES TO THE PROPOSED ACTION

2.3.1 BASE REALIGNMENT AND CLOSURE

Section 204(c)2 of P.L. 100-526 specified that alternative installations to those selected shall not be considered.

> *(2) The provisions of the National Environmental Policy Act of 1969 shall apply to the actions of the Secretary (A) during the process of the closing or realigning of a military installation after such military installation has been selected for closure or realignment but before the installation is closed or realigned and the functions relocated, and (B) during the process of the relocating of functions from a military installation being closed or realigned to another military installation after the receiving installation has been selected but before the functions are relocated. In applying the provisions of such Act, the Secretary shall not have to consider--*
>
> *(i) the need for closing or realigning a military installation which has been selected for closure or realignment by the Commission;*
>
> *(ii) the need for transferring functions to another military installation whch has been selected as the receiving installation; or*

[1]All numbers for acreage, square footage, and personnel within this EIS are subject to slight fluctuations and are therefore approximate.

(iii) alternative military installations to those selected.

In accordance with the above provisions, the only options being considered by the Army concerning realignment and closure are the specific sites where realignment functions will be located at the receiving installation. No alternative options exist to closing or realigning Army functions at the installations recommended by the Defense Secretary's Commission on Base Realignment and Closure.

2.3.2 REUSE ALTERNATIVES

The Army has been working with the City of Alexandria and the public through the Task Force to Monitor the Closing of Cameron Station (hereinafter referred to as the Reuse Task Force). Options still exist for the ultimate reuse of the land on which Cameron Station stands. Formal screening must occur with federal and state agencies before the land can be offered for private sale. Ultimately, whatever is finally proposed for this land must conform with the City's designated zoning for the site if it is transferred out of the federal sector. The City has rezoned Cameron Station from I-1, Industrial, to Coordinated Development District. Zoning information for Cameron Station and the land adjacent to it are discussed in Chapter 3 of this EIS. The eventual reuse of the property will be a decision between the developer and the City of Alexandria after the property has been conveyed.

2.3.3 REALIGNMENT

Sites have been identified at Fort Belvoir, Fort McNair, and Fort Myer for accommodating the relocation of activities from Cameron Station and other BRAC actions. The environmental screening process will ensure that the most environmentally suitable locations are used. The Army has commissioned site studies (e.g., cultural, archeological, and wetlands) that will be used to determine the final siting for future development. This EIS and the preparation of the Fort Belvoir Concept Development Plan are the initial steps in the site identification process. Detailed site design engineering plans are expected to be commissioned in early 1991. Therefore, minor or even major changes can be made in the locations that have been identified to date for realignment. However, the movement of functions to Fort Belvoir, Fort McNair, and Fort Myer will not change.

2.3.4 NO-ACTION ALTERNATIVE

The No-Action Alternative is possible under P.L. 100-526 only if there are absolute environmental constraints, previously unknown, discovered during the preparation of the EIS. At this time, no such constraints are known.

2.4 CLOSURE OF CAMERON STATION

2.4.1 INTRODUCTION

P.L. 100-526 requires that the Army close all its property at Cameron Station (Figure 2-1) within the City of Alexandria, Virginia. Cameron Station is one of three major posts of the MDW Installation, which also includes Fort Myer and Fort McNair.

The 164-acre post includes 29 permanent buildings totaling 1,299,871 square feet, and four temporary buildings totaling 9,444 square feet. Although the post has nine warehouse structures, Cameron Station is primarily an administration facility. Most of the warehouse space has been converted to office space or commissary and post exchange (PX) facilities. Space is provided for many tenant organizations, including the Defense Department's DLA and ancillary activities; the Defense Contract Audit Agency (DCAA); the Engineer Activity Capital Area, and the Joint Personal Property Shipping Office, Washington Area (JPPSOWA).

The station was originally known as the Alexandria Quartermaster Depot, a Class II installation operated by the Quartermaster General. Quartermaster Department responsibilities included the operation of commissaries and PXs. The name was changed to Cameron Station and control was transferred from the Quartermaster General to MDW in 1950. In 1954 it became a permanent Department of the Army installation. The headquarters for the Defense Supply Agency (later redesignated the Defense Logistics Agency) was established about 1962, when most of the warehouses were converted to office space. Post staff positions were eliminated in 1971 with the reorganization of MDW, and the industrial functions of MDW (then located at Fort McNair) were moved to Cameron Station.

More than 80 percent of the land at Cameron Station is covered by either buildings or pavement. Industrial, commercial, and residential development surround the post.

2.4.2 ACTIVITIES AND MISSIONS

The current mission of Cameron Station is to provide logistical support to MDW and other government activities in the NCR, to provide administrative space and support services to tenant agencies with service-wide or worldwide missions, and retail support to the large population of active and retired military personnel in the area. The retail support is provided through the Army and Air Force Exchange Services (AAFES) and commissary operations. The DLA is the largest tenant on the post and employs about 3,000 people, which does not include an additional 586 people that are located off post in leased space within the NCR.

The JPPSOWA is responsible for shipping and receiving the personal belongings of military personnel moving in and out of the NCR. Some of the other smaller activities on post include the *Soldiers Magazine* publications office, and the Institute of Heraldry.

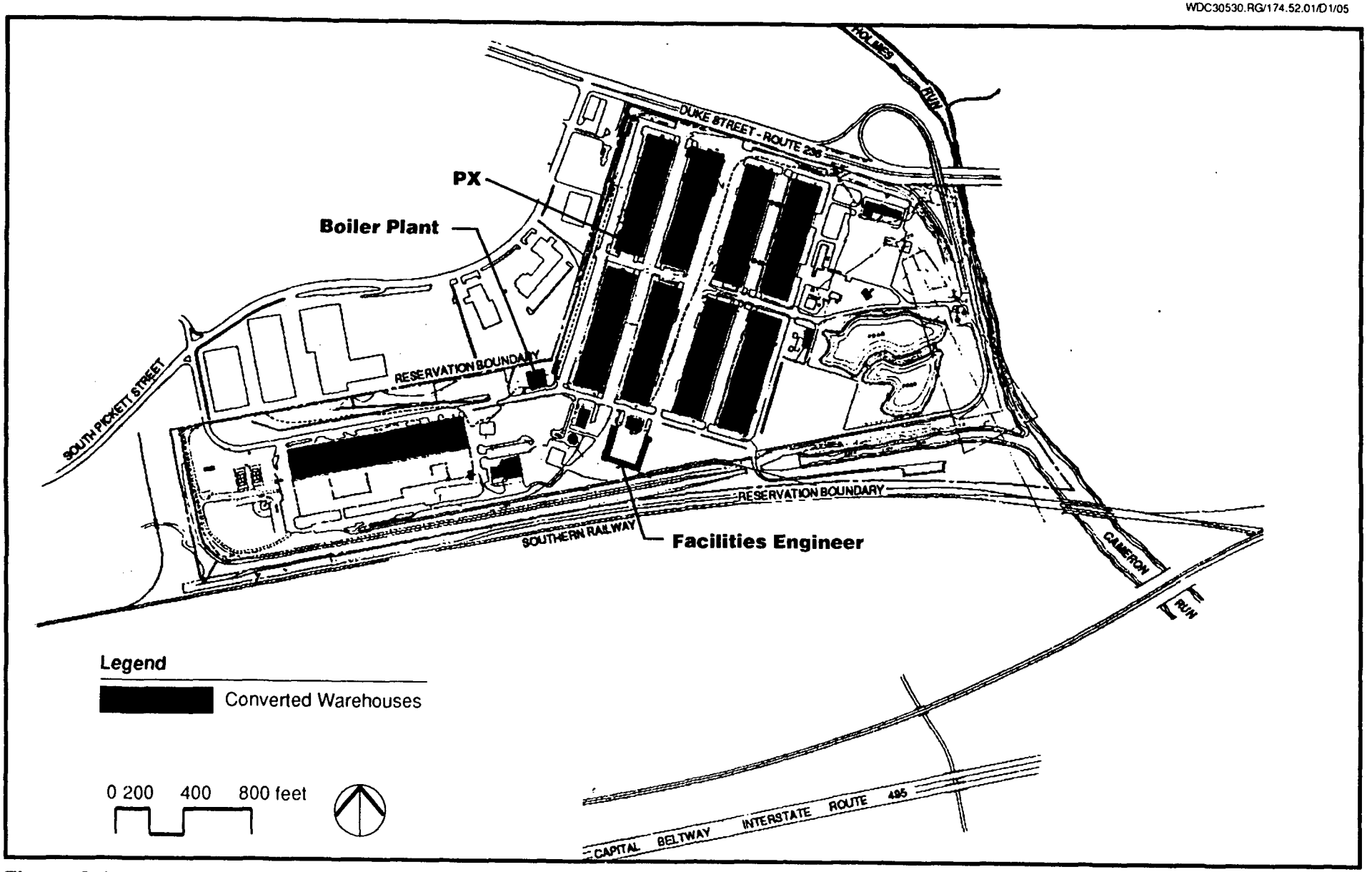


Figure 2-1
Cameron Station

2.4.3 PERSONNEL

Cameron Station has a personnel complement of 3,949, excluding contractor personnel and non-appropriated fund personnel working at commissary and post exchange facilities. The dislocation of personnel that will occur with the realignment and closure are presented in Table 2-1.

Table 2-1
REALIGNMENT OF PERSONNEL FROM CAMERON STATION*

	Military	Civilian	Total
Current	319	3,630	3,949
Realigned	317	3,518	3,835
Estimated	2	112	114

*All numbers for personnel in this table are subject to fluctuations and are therefore approximate.

Two military and approximately 112 civilian positions will be eliminated. Of the remaining approximately 3,835 positions being relocated, 3,641 will be assigned to Fort Belvoir, 192 will be assigned to Fort Myer, and 2 will be assigned to Fort McNair.

2.4.4 SCHEDULE

Personnel from Cameron Station will relocate to Fort Belvoir, Fort McNair, and Fort Myer beginning in 1991, after the ROD is signed, through 1995. Alternative schedules are not possible because of the statutory deadline for completing the realignment and the constraints imposed by the construction and renovation of facilities at the receiving installations.

2.5 REALIGNMENT OF ARMY ACTIVITIES

2.5.1 INTRODUCTION

Some base realignments and closures in other parts of the United States will also result in personnel relocations to and from Fort Belvoir. The ISC activity, which consists of approximately 320 personnel, will be relocated from Fort Belvoir to Fort Devens, Massachusetts. The migration of personnel because of base realignment and closure is shown on Figure 2-2. Table 2-2 lists BRAC and CDP actions proposed for Fort Belvoir.

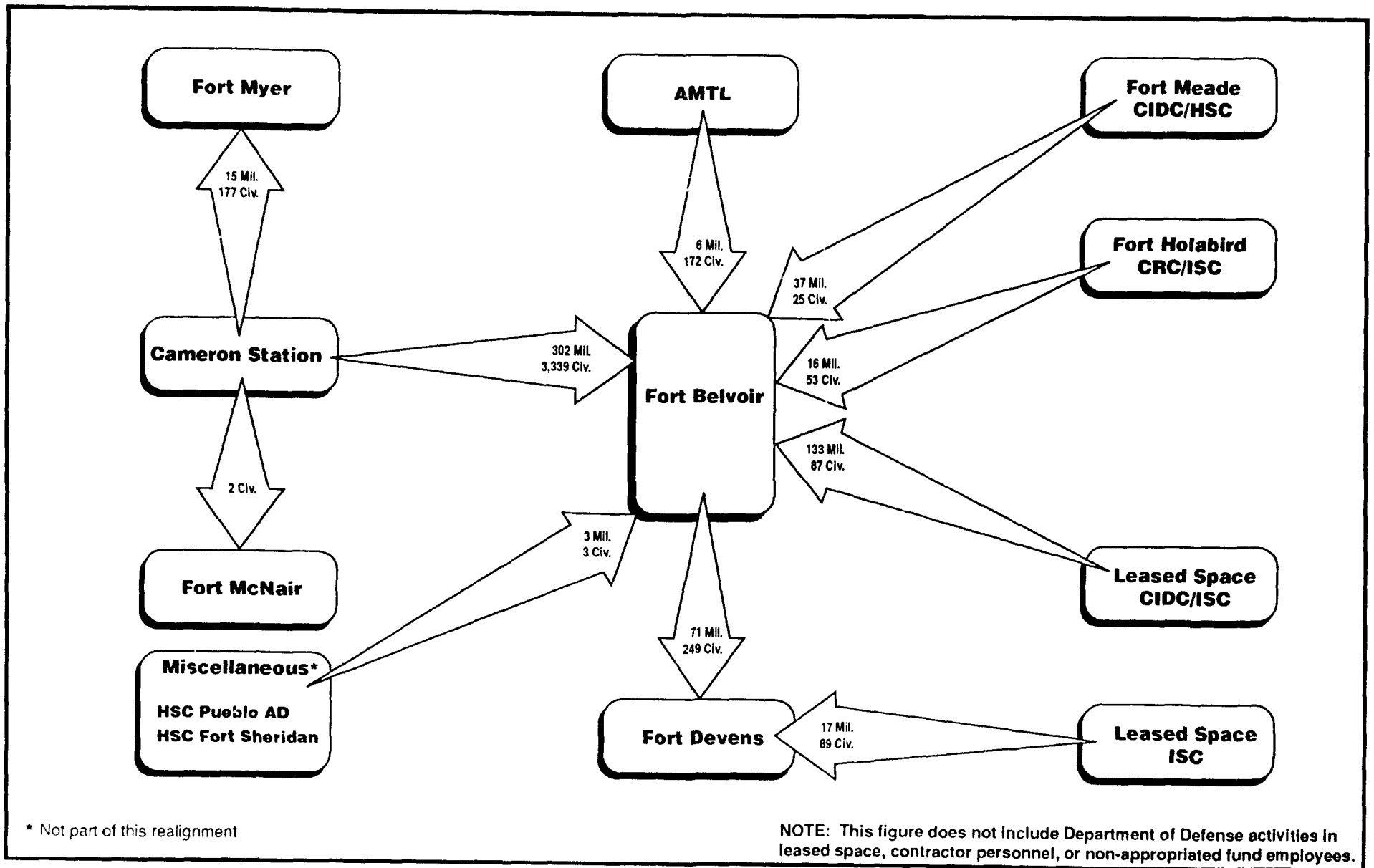


Figure 2-2
Base Realignment and Closure Migration,
U.S. Army, Military District of Washington

Table 2-2
PROPOSED BASE REALIGNMENT AND CLOSURE AND CONCEPT DEVELOPMENT PLAN ACTIONS AT FORT BELVOIR

Base Realignment and Closure (BRAC) Actions

1. Headquarters Complex
2. Industrial Park
3. BRAC Roads
4. Commissary Warehouse Addition*
5. Post Exchange
6. Commissary
7. Administration Facility
8. Material Research Facility
9. Exchange Branch
10. Modify Buildings 1466 and 1445 for Base Closure

Concept Development Plan Actions

Military Construction Activity (MCA)**

1. Child Development and Religious Education Centers
2. Electronics Supply and Maintenance Facility
3. D.C. Army National Guard Armory
4. D.C. Army National Guard Aircraft Parking Apron
5. Convert Buildings 206 and 208 to Classrooms
6. Veterinary Clinic
7. Operations Building Renovation, Engineer School Backfill
8. Telephone Switch Upgrade, Post-wide
9. Fixed-Wing Runway Extension
10. Old Guard Horse Stables
11. Main Sewer Line Upgrade, Post-wide
12. North Post Fire Station
13. Headquarters, Air Force Intelligence Agency
14. Physical Fitness Center
15. Virginia Army National Guard Armory/Headquarters (29th Light Infantry Division)
16. Gunston Road Extension
17. D.C. Army National Guard Hangar Addition
18. Seabee Operational Storage Facility
19. Renovate Heat Plant
20. Renovate Building 361 for ADP
21. D.C. Army National Guard Academy
22. Electrical Upgrade, Post-wide, Phase I
23. Lateral Sewer Line Repair, Post-wide
24. Relocate EPG Test/Storage Facilities
25. Ammunition Storage Facility
26. Information Systems Facility
27. CIDC Field Operations Building
28. D.C. Army National Guard Cantonment Area
29. Main Post Library
30. (There is no MCA 30)
31. Loop Road

(Development Plan: MCA, continued)

32. Community Center/Welcome Center
33. Facility Engineer Maintenance Shop
34. Warehouses
35. Tactical Energy Systems Lab
36. Conforming Storage Building (DRMO)
37. Military Police Station
38. Reserve Center/OMA (80th Div)
39. Consolidated Maintenance Shop (DOL)
40. Electro-Optics Laboratory
41. Fatigue Test Facility
42. Potential 500-person Administrative Facility, HEC

Non-Appropriated Funds (NAF)

1. Youth Center
2. Tompkins Basin Armed Forces Recreation Area
3. Horse Stables
4. Benyuard Pool Addition
5. Golf Course
6. Corporate Fitness Center
7. Child Development Center
8. Temporary Lodging Facility

Army and Air Force Exchange Services (AAFES)

1. Fast Food Facility (Burger King™)
2. Fast Food Facility (Chicken)
3. Car Care Facility

Army Family Housing (AFH)

1. Lewis Heights Renewal, Phase 1
2. Lewis Heights Renewal, Phase 2
3. 1,500 Housing Units (New)
4. Dogue Creek Village Whole-House Renewal
5. George Washington Village Whole-House Renewal
6. River Village Whole-House Renewal
7. Belvoir Village Whole-House Renewal
8. Gerber Village Whole-House Renewal
9. Visiting Officers Quarters Renovation
10. Jadwin Loop Whole-House Renewal
11. Colyer Village Whole-House Renewal
12. Rossell Loop Whole-House Renewal
13. Woodlawn Village Whole-House Renewal
14. Fairfax Village Whole-House Renewal

*Authorization and funding for this project has been withdrawn. It is included for informational purposes because it was part of the original scope.
**MCA in this context is not a funding appropriation.

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2.5.2 ARMY MATERIAL TECHNOLOGY LABORATORY

The Commission's report to Congress recommended closure of AMTL. This facility supports other defense laboratories in the fields of material development research, technical assistance, and failure analyses. The Commission recommended dispersal of AMTL's activities to three facilities. Fort Belvoir is to receive the corrosion prevention and control research, to be located with facilities performing similar activities. The other existing AMTL activities will be realigned to the U.S. Tank-Automotive Research Development and Engineering Center at Detroit Arsenal and to the Development and Engineering Center at Picatinny Arsenal, New Jersey. The closure of AMTL is addressed in a separate EIS. Only the realignment of personnel to Fort Belvoir is addressed in the Fort Belvoir EIS. The realignment to Fort Belvoir involves approximately 6 military and 172 civilian positions.

2.5.3 CAMERON STATION

A list of activities and personnel relocating to Fort Belvoir from Cameron Station because of base closure is presented in Table 2-3. Table 2-4 lists the activities relocating to Fort Myer from Cameron Station. Two of MDW Information Management's civilian employees will be relocated to the Mail Distribution Service at Fort McNair.

2.5.4 FORT BELVOIR

The mission and activity descriptions for Fort Belvoir are discussed in detail in the Fort Belvoir Concept Development Plan.

2.5.4.1 Relocated Personnel. Approximately six personnel realignments are planned as part of BRAC. Some of these realignments do not require the construction of additional facilities as the effected personnel are either being consolidated with similar functions at Fort Belvoir or being assigned to existing facilities.

2.5.4.1.1 Information Systems Engineering Command. The Information Systems Engineering Command (ISEC) of the ISC, currently at Fort Belvoir, will be realigned to Fort Devens, Massachusetts, as part of BRAC. Separate NEPA documentation is being prepared for the realignment to Fort Devens.

2.5.4.1.2 Criminal Investigation Command. The Commission's report to Congress recommended that the activities of the CIDC be consolidated at Fort Belvoir using space vacated by the ISC, which will relocate to Fort Devens, Massachusetts. The effect of the actions will be to consolidate a number of commands and activities whose operations are currently separated. This will improve efficiency, mission effectiveness, command, and control. Accordingly, the CIDC Headquarters, which was scheduled to relocate to Fort Meade under a previous decision, will be realigned to Fort Belvoir from leased space within the NCR and consolidated with the activities from Fort Meade and Fort Holabird. The realignment of personnel to Fort Belvoir is addressed in this EIS. Separate environmental analyses are being completed to address the effects of the partial closure of Fort Meade and Fort Holabird.

Table 2-3
MIGRATION OF CAMERON STATION PERSONNEL TO FORT BELVOIR

Activity	Destination	Number of Personnel*
Defense Logistics Agency		
Headquarters	Headquarters Complex	916
Management Support Activities	Headquarters Complex	330
Administrative Support Center	Headquarters Complex	642
Defense Technical Information Center	Headquarters Complex	383
Defense Fuel Supply Center	Headquarters Complex	743
Air Force Detachment 29	Headquarters Complex	19
Naval Petroleum Office	Headquarters Complex	30
Defense Contract Audit Agency	Headquarters Complex	135
United States Army		
Aeronautical Services Office	Building 1466	20
Institute of Heraldry	Building 1466	38
Soldiers Magazine	Building 1466	14
Recruiting Support Command	Industrial Park	76
Engineer Activity Capitol Area	Industrial Park	28
Baltimore Corps of Engineers	Industrial Park	17
Troop Support Agency	Commissary	51
Military District of Washington		
Deputy Chief of Staff for Personnel	Industrial Park	2
Deputy Chief of Staff for Logistics	Directorate of Logistics	18
Defense Supply Service, Washington	Industrial Park	36
Health Services Command	Dewitt Hospital	9
Joint Personal Property Shipping Office, Washington Area	Building 1466	134
Total Government Employees		**3,641**
Government Contractor	Headquarters Complex	10
Government Contractor	Industrial Park	34
TOTAL EMPLOYEES		**3,685**

*All numbers for personnel in this table are subject to fluctuations and are therefore approximate.

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Table 2-4
MIGRATION OF CAMERON STATION PERSONNEL TO FORT MYER

Activity	Destination	Number of Personnel*
Commissary	Commissary	28
MDW		
Information Management	Mail Center	1
Directorate of Contracting	Logistics Complex	33
Deputy Chief of Staff of Personnel	Outdoor Recreation	3
Deputy Chief of Staff of Logistics	Logistics Complex	118
United States Army		
Engineer Activity Capitol Area	Logistics Complex	9
	TOTAL	**192**

*All numbers for personnel in this table are subject to fluctuations and are therefore approximate. This table does not include any contractor or nonappropriated fund personnel.

2.5.4.1.3 Defense Logistics Agency/Defense Contract Audit Agency. DLA and other Defense personnel located in leased space within the NCR will be relocated personnel in the Headquarters complex at Fort Belvoir. The relocation of personnel in leased space is included in this EIS.

2.5.4.1.4 Health Services Command. Nine U.S. Army Health Services Command personnel from Cameron Station will be realigned to DeWitt Hospital. They will be joined by additional Health Services Command personnel being realigned from Pueblo Army Depot, Colorado (2), Fort Sheridan, Illinois (4), and Fort Meade, Maryland (5). The realignment effects of the Pueblo Army Depot and Fort Sheridan personnel will be covered in other EIS documents.

2.5.4.1.5 Joint Personal Property Shipping Office, Washington Area. The JPPSOWA will realign personnel from Cameron Station to Fort Belvoir. They will be assigned to an existing building (Building 1466), which will be renovated for their use.

2.5.4.1.6 MDW Deputy Chief of Staff for Logistics. Eighteen people from MDW Deputy Chief of Staff for Logistics (DCSLOG) at Cameron Station will be realigned to the existing Directorate of Logistics (DOL) facility at Fort Belvoir. No new construction or renovations are required for this relocation.

2.5.4.1.7 U.S. Army Corps of Engineers, Baltimore District. Personnel will be relocated from Cameron Station to existing facilities in Building 1442 at Fort Belvoir. No construction or renovation is required for this action.

2.5.4.2 Proposed Facilities. Ten separate construction projects are planned at Fort Belvoir to accommodate realignment activities. These construction projects are designated as indicated below:

Headquarters Complex	BRAC 1
Industrial Park	BRAC 2
BRAC Roads	BRAC 3
Commissary Warehouse Addition	BRAC 4[2]
Post Exchange	BRAC 5
Commissary	BRAC 6
Administration Facility	BRAC 7
Material Research Facility	BRAC 8
Exchange Branch	BRAC 9
Modify Buildings 1466 and 1445 for Base Closure	BRAC 10

2.5.4.2.1 Headquarters Complex (BRAC 1). BRAC 1 is the largest construction project. It is planned to provide approximately 790,000 square feet for offices, computer and automated data processing, and a storage and distribution warehouse, as well as onsite infrastructure facilities. A portion of the Headquarters Complex will support other Department of Defense (DOD) activities now located in leased space. These activities will be collocated with associated activities relocating from Cameron Station. Depending on the outcome of detailed design engineering, from one to four buildings may be required.

In selecting proposed sites for the Headquarters Complex, several parameters were taken into consideration. The first was that the site had to be large enough to accommodate approximately 4,000 people, who would need 1,000,000 square feet of space. However, non-BRAC requirements to collocate additional DLA and Defense Financial Service Center people have increased the initial estimate to approximately 4,200. DLA will prepare NEPA documentation for these relocations. Another parameter taken into consideration was multiple accesses so that people could get in and out of the facility, which would minimize the impact to the environment. A water line in the area of the preferred alternative (Figure 2-3) is needed, so a water study was performed to determine utility requirements. A former training area, the preferred alternative is already disturbed.

Alternative 2 is located on the northwestern boundary of the preferred alternative (Figure 2-4). This site had been under consideration for the relocation of AMC to Fort Belvoir. The site is a broad plateau surrounded by steep slopes and stream valleys. Portions of the site have been disturbed by training activities but not to the extent of the preferred alternative.

[2]Funding for this project has been withdrawn; it is included in this EIS for informational purposes because it was part of the original scope.

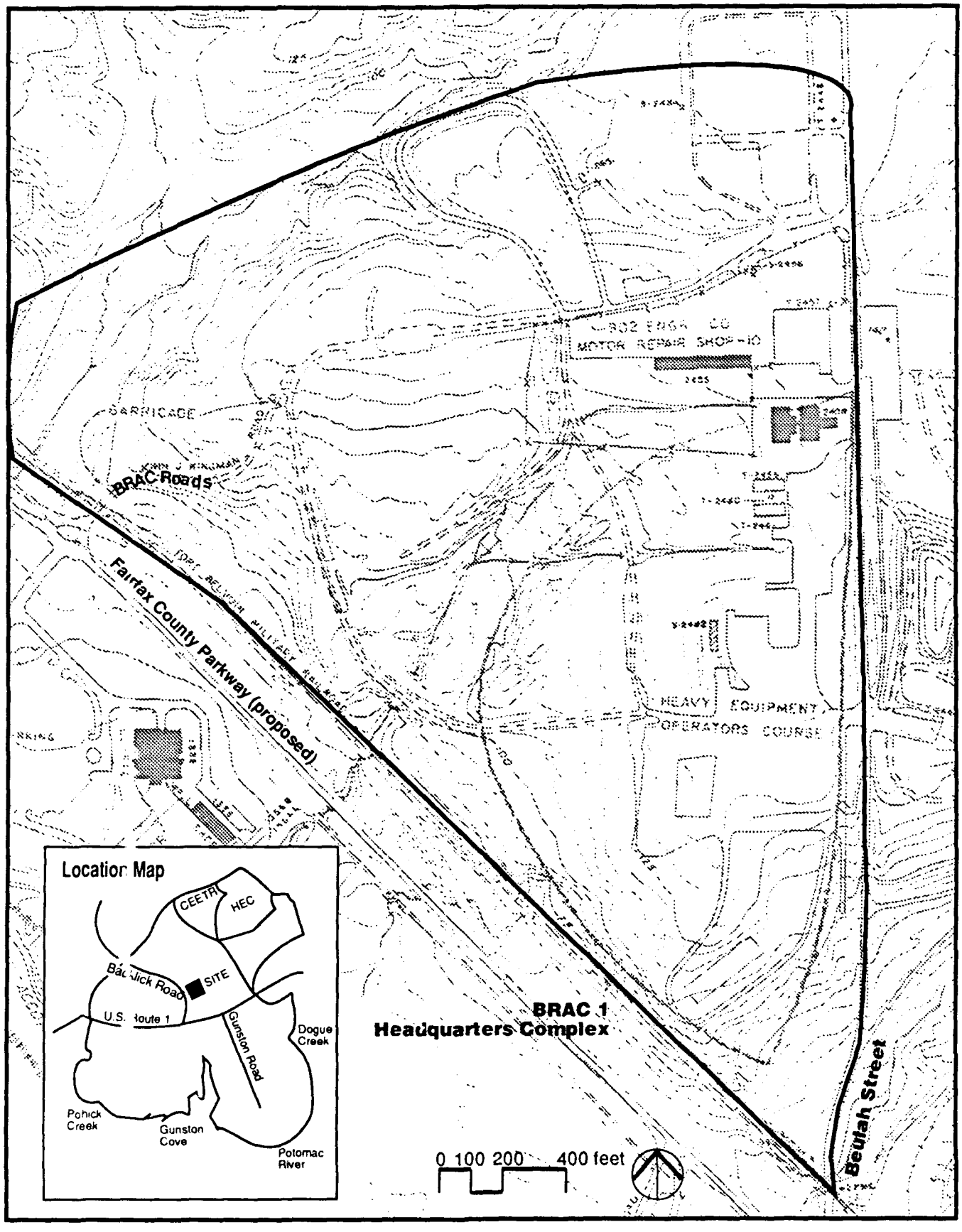


Figure 2-3
BRAC 1, Preferred Alternative

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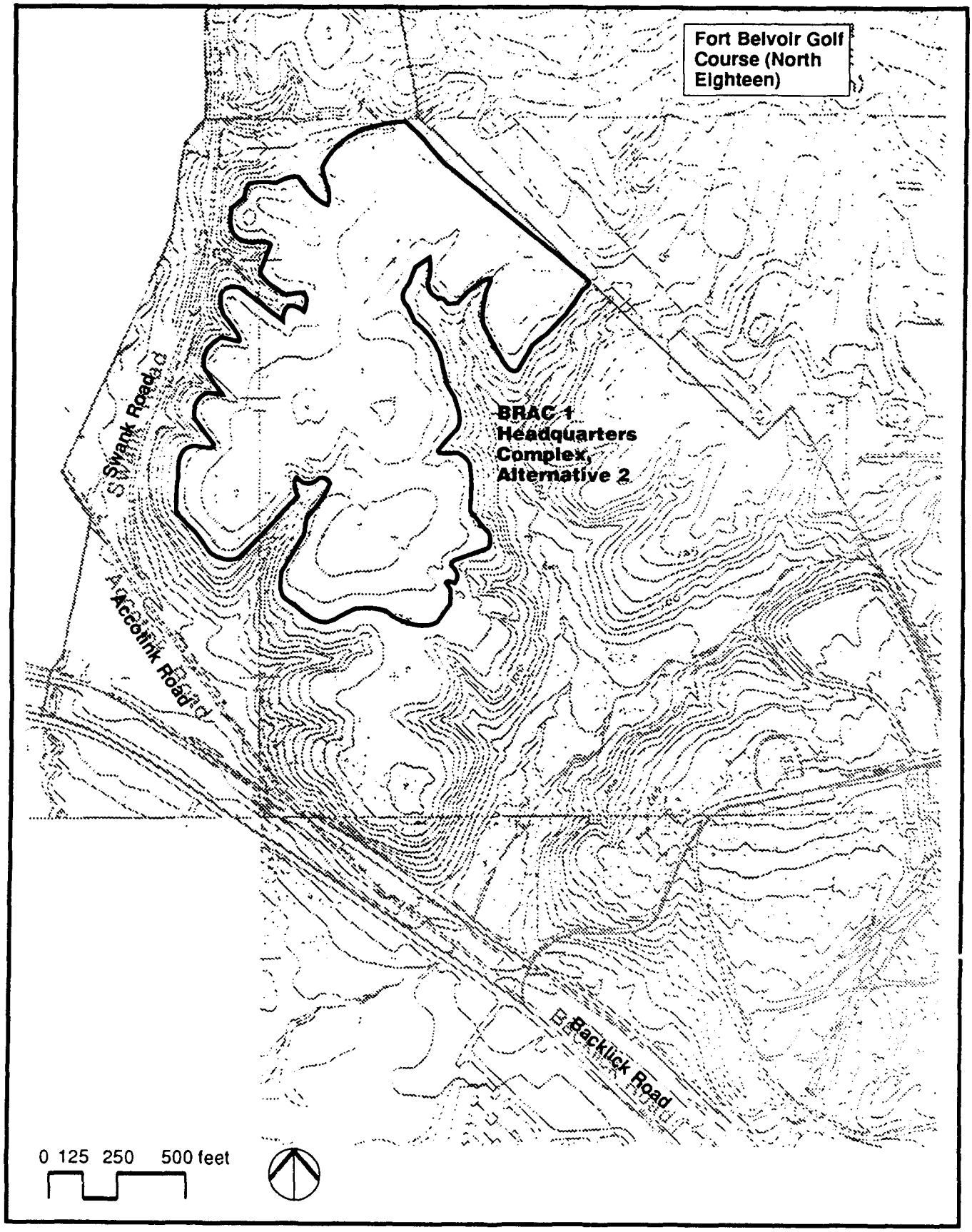


Figure 2-4
BRAC 1, Alternative 2

Alternative 3 involves the backfilling of up to 13 buildings vacated by the Engineer School. The buildings are scattered throughout the post (Figure 2-5). Use of this alternative may result in large-scale activities being divided into separate buildings because of space constraints in some of the buildings.

2.5.4.2.2 Industrial Park (BRAC 2). This facility will house the personnel currently performing industrial and warehouse operations at Cameron Station. The approximately 224,000-square-foot facility will include warehouse and administrative space, a cafeteria, and a snack bar. Supporting facilities include utilities, an electric substation, paving, walks, curbs and gutters, parking, roads, fire protection and alarm systems, and site improvements.

Two sites were considered for the industrial park. The preferred alternative is located on the South Post west of Thoete Road (Figure 2-6) near the industrial area of Fort Belvoir and adjacent to the debris landfill. This site was selected for consideration because the location was already slated to become an industrial area. The area is large enough, it is a disturbed site (the site of a former WWII complex that has already been leveled), and utilities are readily available, which enhances its desirability as an industrial park site.

Alternative 2 is located off Richmond Highway (U.S. Route 1) near the light-demolition range (Figure 2-7). This site does not currently have electricity, water, or sewer available. Poe Road will also need extensive paving and upgrading to accommodate the traffic generated by the industrial park. A land-use change is also required for this site.

2.5.4.2.3. BRAC Roads (BRAC 3). This project will provide a major access road to the preferred alternative for BRAC 1 on the North Post and a separate access road for the preferred alternative for BRAC 2 on the South Post. The preferred alternative for BRAC 3, North, would follow the existing alignment of John Kingman Road (an unimproved dirt road) for most of its length (Figure 2-8). This alternative calls for BRAC 3, North, to be a four-lane road between the Fairfax County Parkway and Beulah Street (extended) and a two-lane road between Beulah Street and Woodlawn Road.

Alternative 2 follows the same alignment as the preferred alternative (Figure 2-8) but only the four-lane section between the Fairfax County Parkway and Gunston Road (extended) would be constructed.

The preferred alternative for BRAC 3, South, would be a two-lane road from the intersection of Pohick and King Roads to the intersection of Warren Road, Clapp Road, and 21st Street (Figure 2-9). This project also includes the construction of left- and right-turn lanes, signal upgrades, and additional lanes on Gunston Road to accommodate BRAC-related traffic.

The alternative for the new road would require that the truck traffic be routed through the post's housing areas using one of two routes.

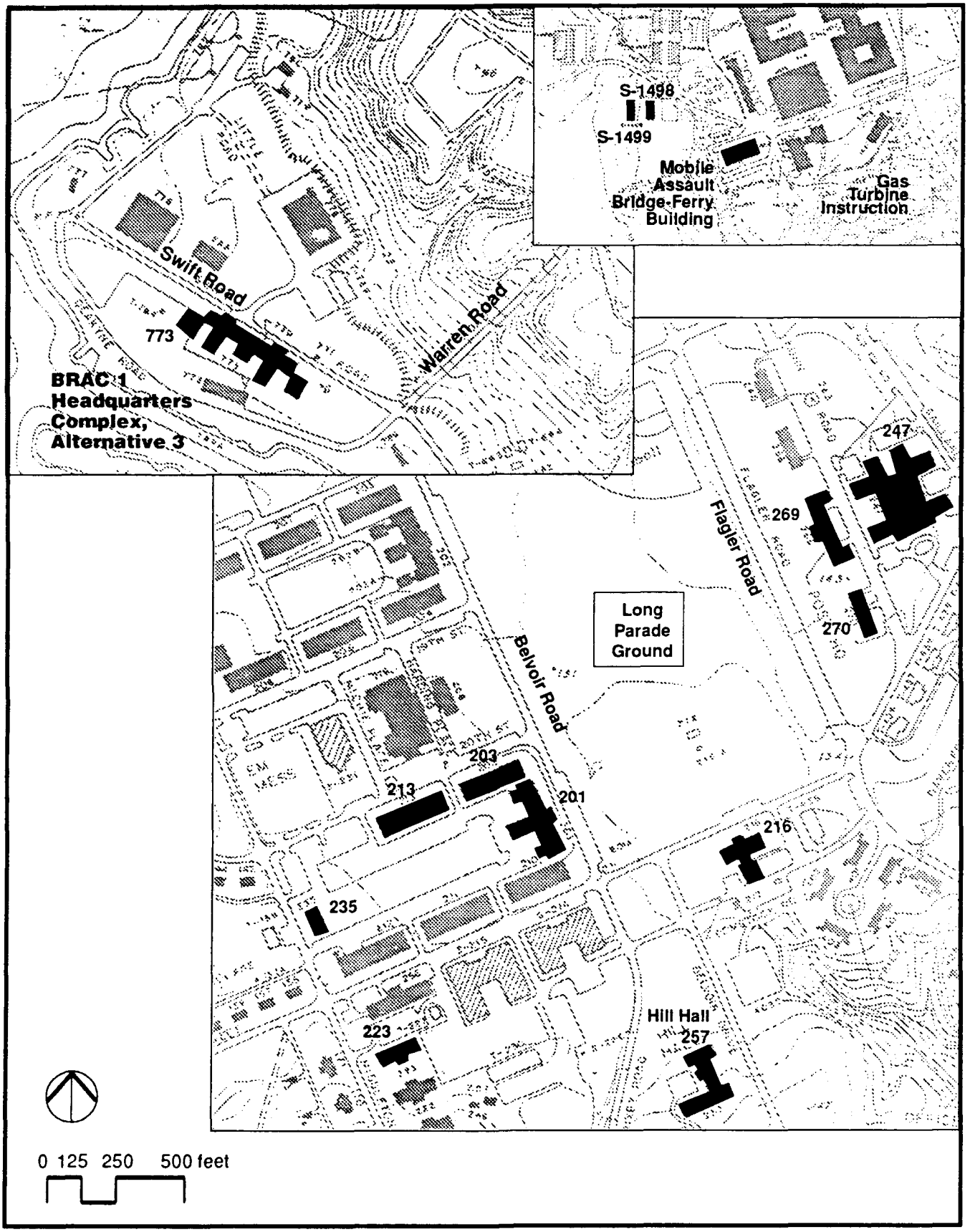


Figure 2-5
BRAC 1, Alternative 3

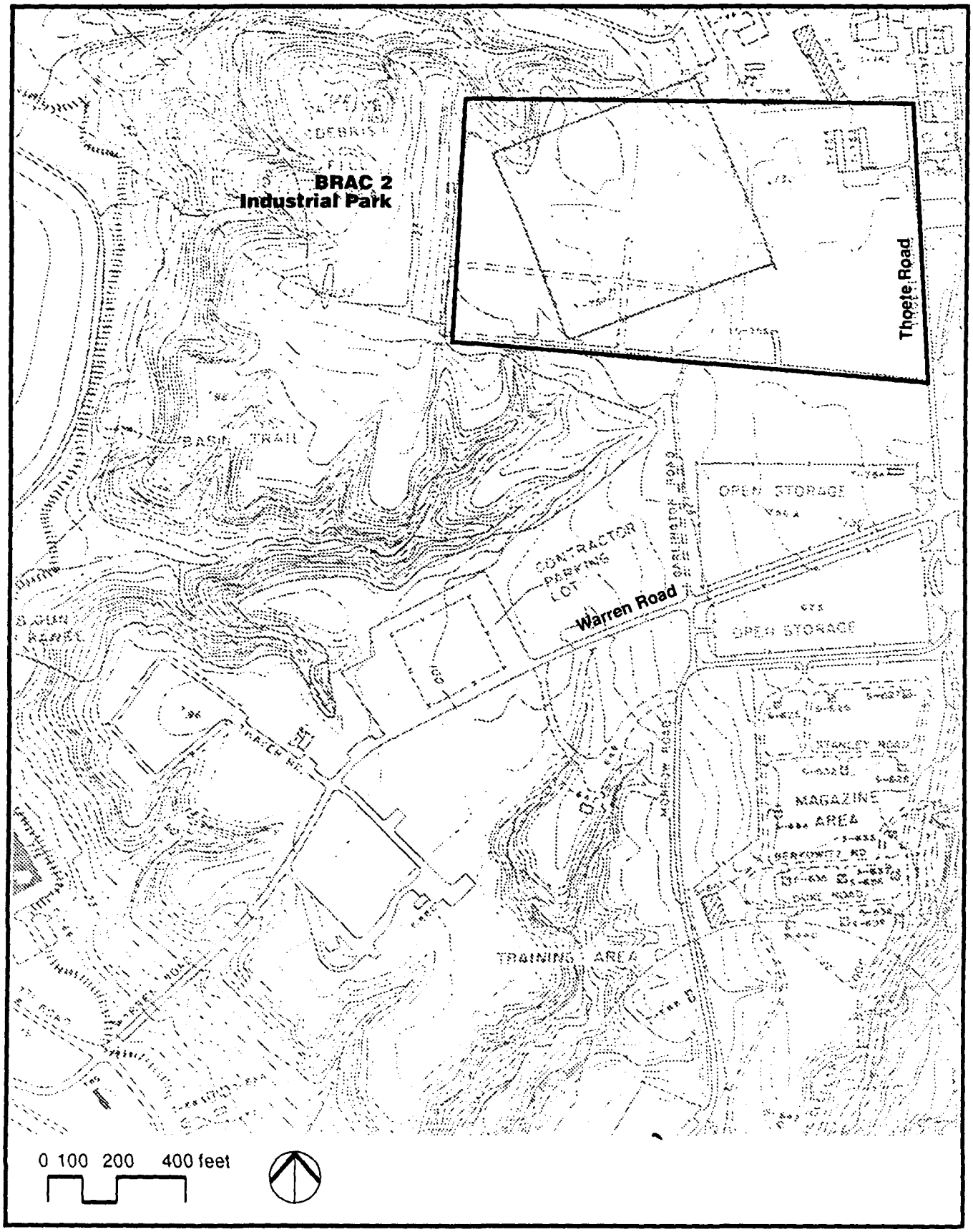


Figure 2-6
BRAC 2, Preferred Alternative

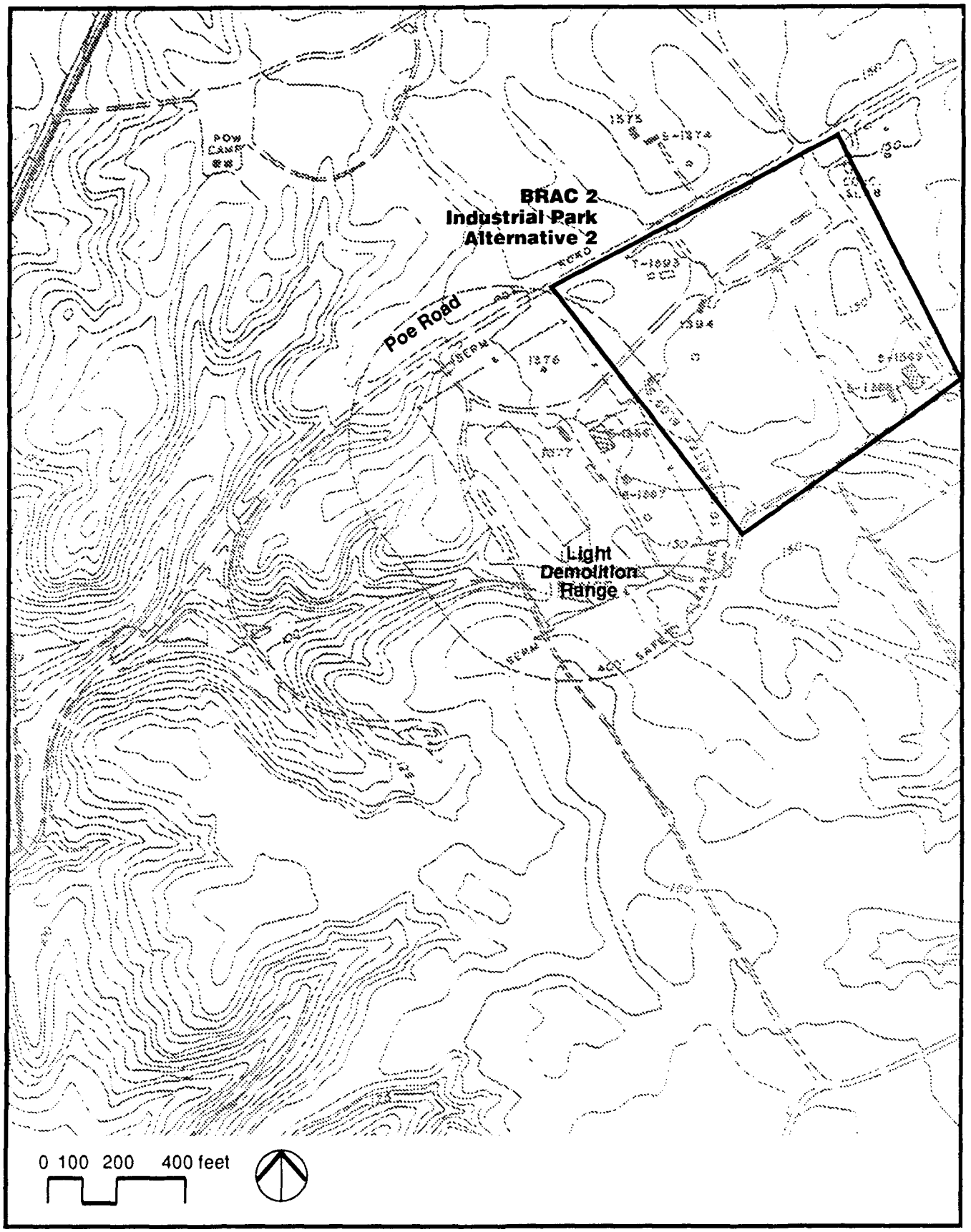


Figure 2-7
BRAC 2, Alternative 2

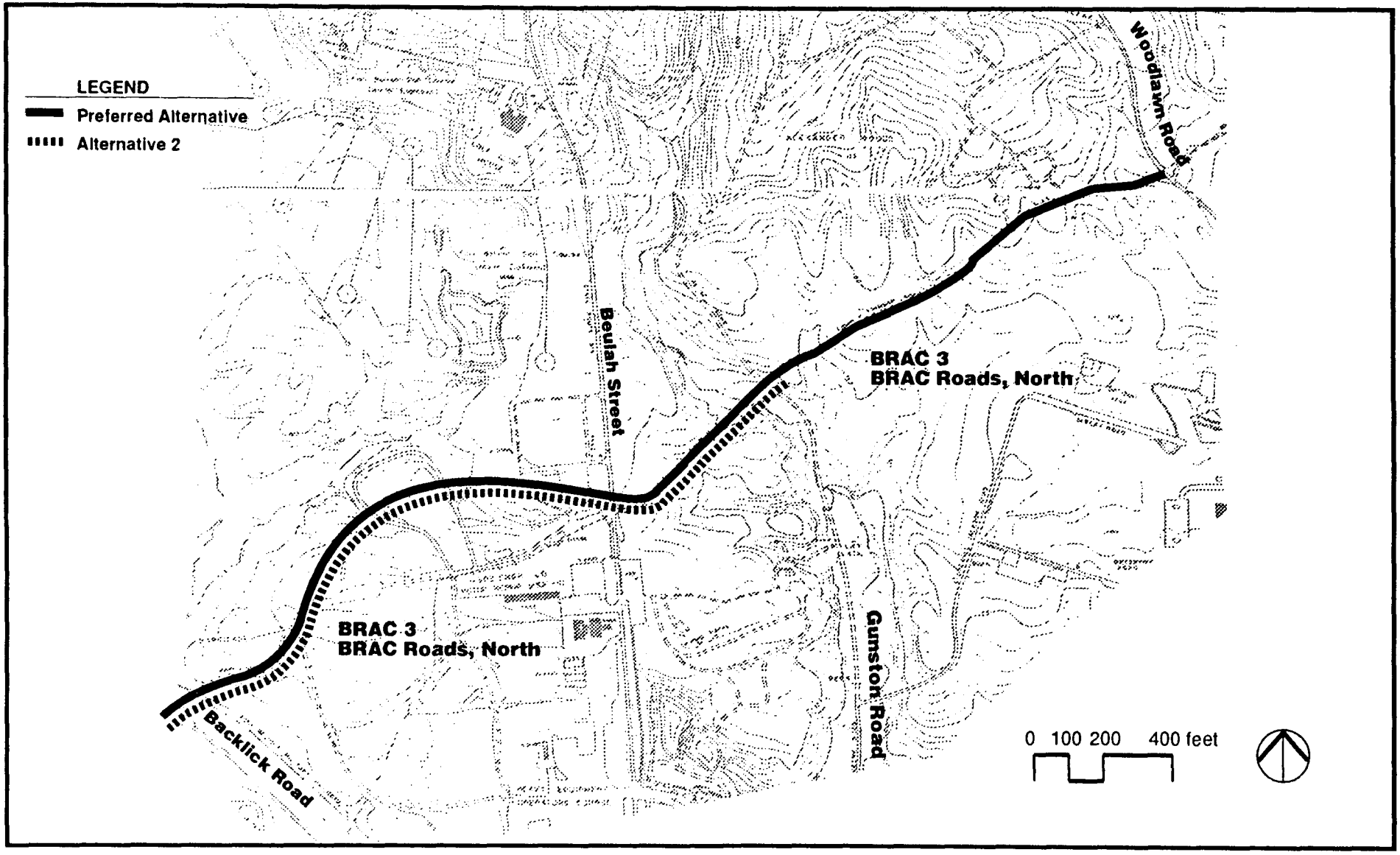


Figure 2-8
BRAC 3, North, Preferred Alternative and Alternative 2

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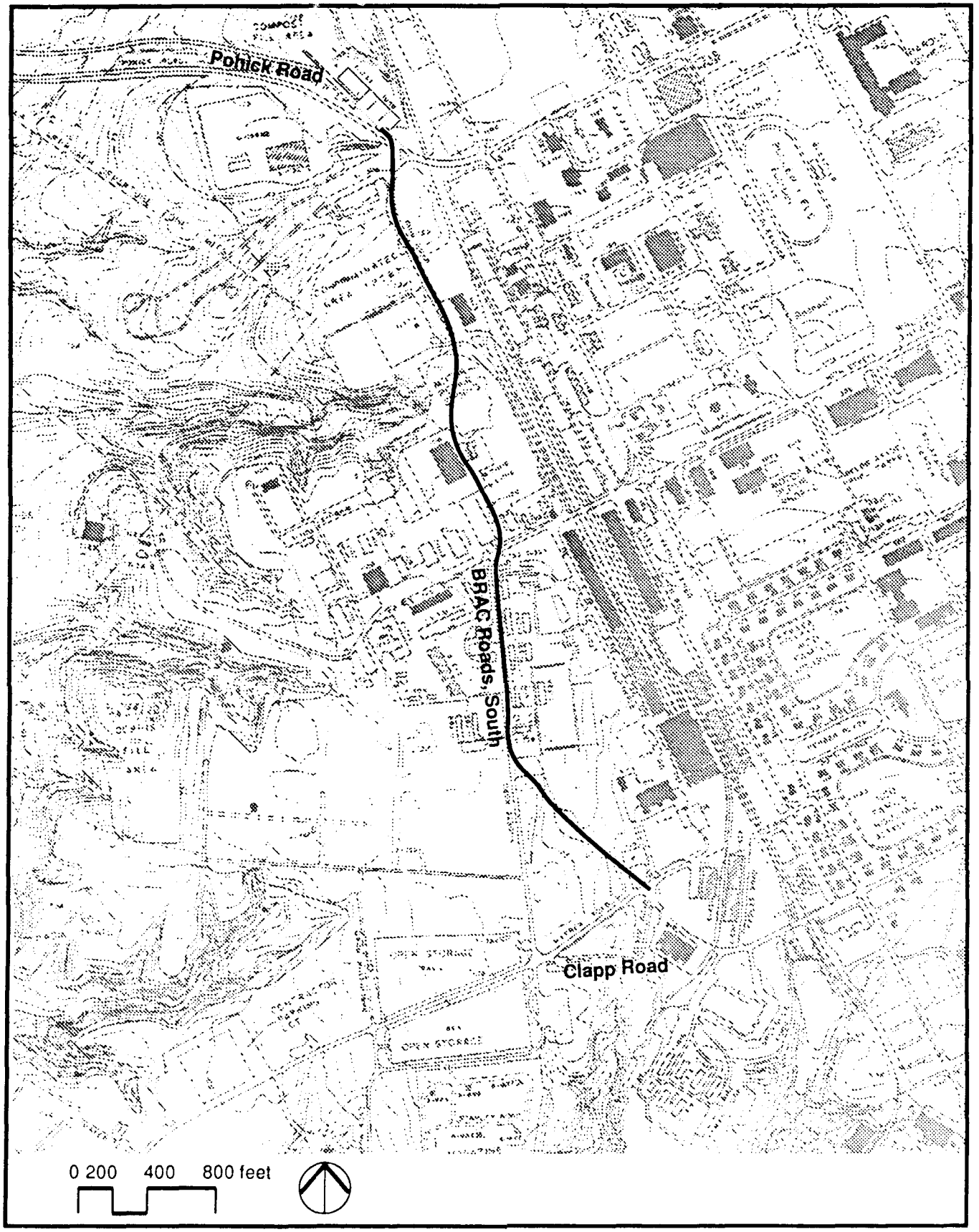


Figure 2-9
BRAC 3, South,
Preferred Alternative

Alternative 1 would allow truck access from all gates and truck traffic would wind through housing areas.

Alternative 2 would restrict truck traffic to Pohick Road and Gunston Roads.

Both alternatives would require general road improvements throughout the South Post to minimize damage from the truck traffic to the existing roads.

2.5.4.2.4 Commissary Warehouse Addition (BRAC 4). The Commissary at Cameron Station is among the largest in the continental United States, serving a large segment of the NCR. The Cameron Station commissary facilities, including the warehouse that is also used to support the existing Fort Myer Commissary, occupy approximately 157,800 gross square feet. BRAC 4 was proposed at Fort Belvoir with approximately 39,932 square feet of space. Thirty-eight percent of this total is related to base closure and the remaining 62 percent of the total space was required to satisfy an existing need for commissary warehouse space. The non-BRAC portion of the facility would have been funded with nonappropriated funds.

Two sites were available for the Commissary warehouse. Alternative 1 was to construct the warehouse addition on the North Post near the existing Commissary (Figure 2-10). Alternative 2 was to construct the warehouse addition at the new site of the South Post commissary (BRAC 6). These alternatives, however, were dropped from further consideration when Congressional authorization and funding were withdrawn.

2.5.4.2.5 Post Exchange (BRAC 5). The project will provide approximately 72,120 square feet of space and will include a main exchange warehouse; a mechanical room; and areas for services, a main exchange, food service, and a mall. Supporting facilities will include all required utilities, fire protection, alarm systems, paving, storm drainage, and site improvements. This project along with the existing commissary on North Post will form an exchange/commissary shopping complex.

Two alternatives were considered for this BRAC action. The preferred alternative is to construct a new PX on the North Post near the existing commissary. This would create a central shopping area on the North Post (Figure 2-10) serving retirees and North Post residents. Alternative 2 is the expansion of the existing South Post PX (Figure 2-11). Funding for this project will be provided by AAFES.

2.5.4.2.6 Commissary (BRAC 6). This new facility is planned to have a 100,000-gross-square-foot capacity. Approximately 48 percent of the total project is related to base closure, and the remaining 52 percent is required to satisfy an existing need for commissary space at Fort Belvoir. The facility will include a sales area; cold and frozen storage; office, training, and employee areas; and a computer room. Supporting facilities will include utilities, refrigeration support systems, an access road, parking, a loading dock area, walks, curbs and gutters, storm drainage, and site improvements.

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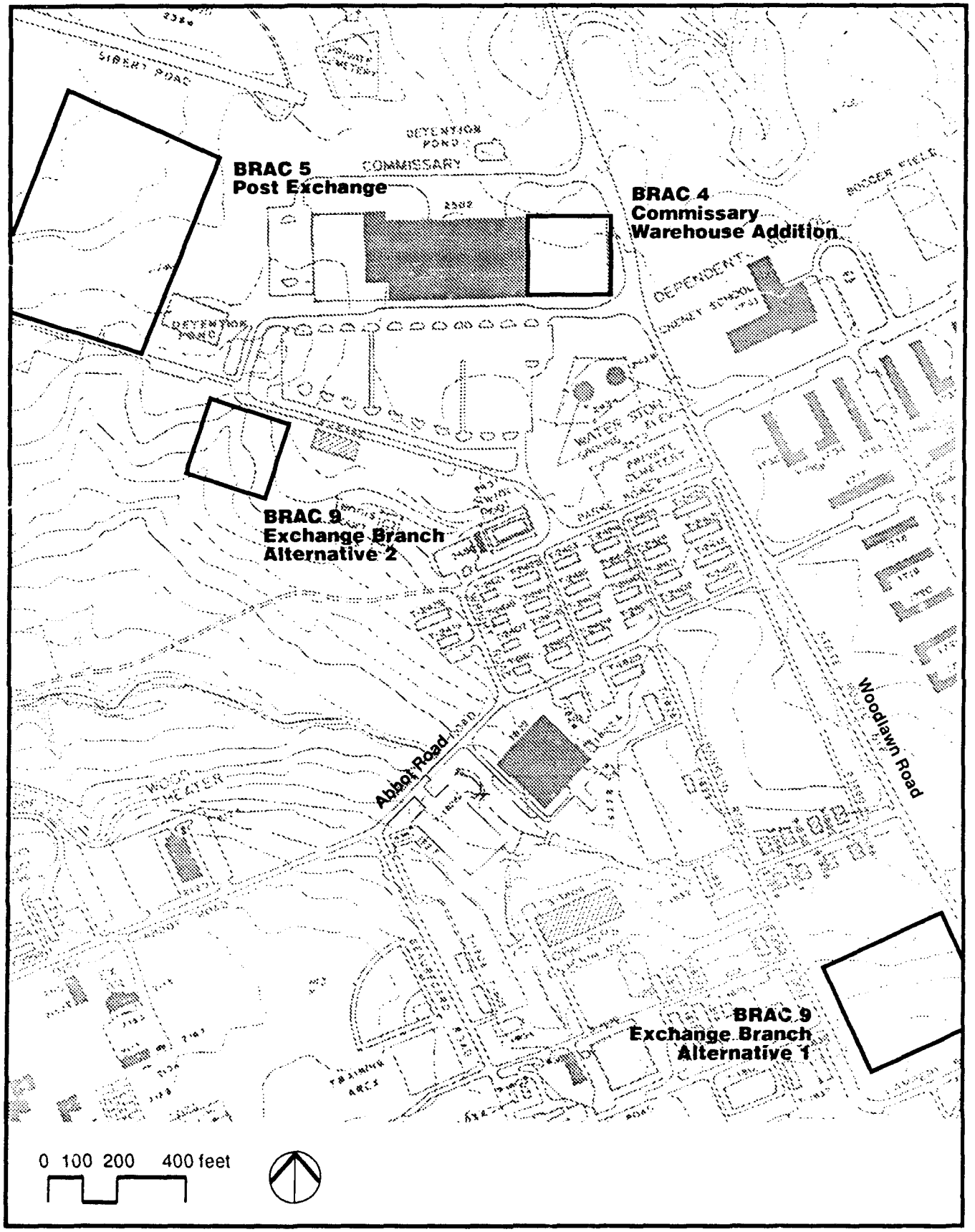


Figure 2-10
BRACs 4 and 5—Preferred Alternatives
BRAC 9, Alternatives 1 and 2

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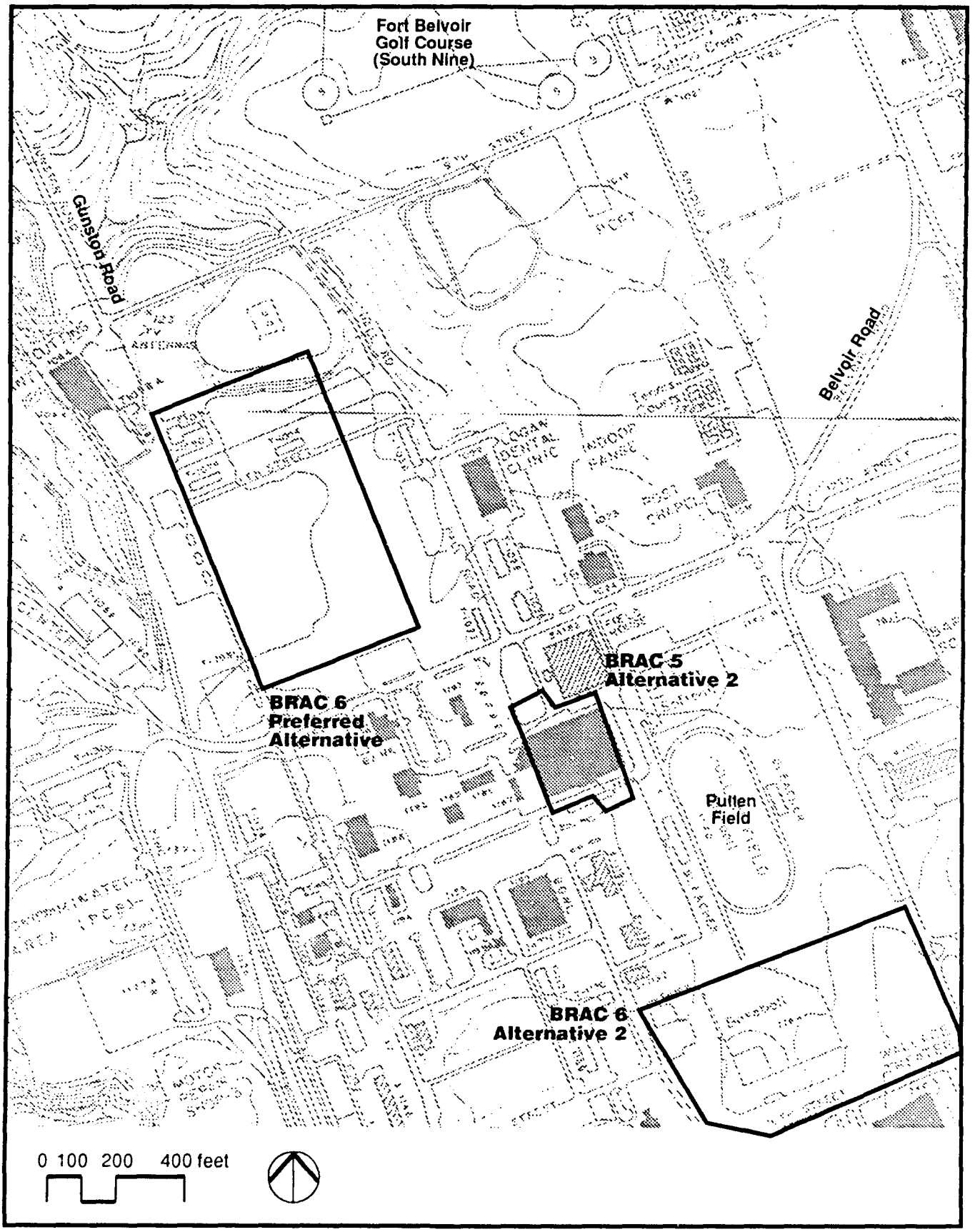


Figure 2-11
BRAC 6, Preferred Alternative and BRACs 5 and 6, Alternative 2

Two alternate sites were analyzed. The preferred alternative is located at Gunston Road and 12th Street (Figure 2-11), with Alternative 2 located at Gunston Road and 16th Street (Figure 2-11). The 16th Street site would have required relocation of the sports fields on 16th Street and elimination of some mature trees. In addition, the site is adjacent to the historic area. Because relocation of the sports fields would affect their use by the community and the site was close to historic sites, it was not considered further. The 12th Street site was preferred because of the ease of access, its disturbed nature, and its previous consideration for a commissary of a larger size. Funding for this project will be provided by the Troop Support Agency.

2.5.4.2.7 Administration Facility (BRAC 7). Located on the South Post (Figure 2-12), Building 1465 was originally designed as a barracks. Currently it is being used by ISC. The BRAC Commission recommended that the CIDC activities use space vacated by ISC. ISC is relocating to Fort Devens, and reuse of this space for an administrative facility would be more cost effective than constructing a new facility. Building 1465 still retains the four-, six-, and eight-man-room configurations. The building lacks central air conditioning, does not meet current energy conservation standards, and contains numerous safety code violations. Therefore, Building 1465 will be renovated. The renovations will include: entrance stairs, windows, acoustical ceilings, exterior doors, electrical and plumbing systems, new HVAC system, handicap access ramps, exterior wall insulation, security lighting, and a new fire sprinkler system. Asbestos will be removed and a 9,000-square-foot addition will be constructed. The CIDC activities are administrative and require office and document storage facilities.

2.5.4.2.8 Material Research Facility (BRAC 8). Major components of this new facility are to include a materials laboratory (approximately 81,000 square feet) and an administration and maintenance building (approximately 28,200 square feet). This facility is to include experimental and test areas, computer and data-communication rooms, conference and analysis areas, offices for scientists and engineers, and building maintenance and storage areas. Support facilities will include utilities, electric service, information systems, fire protection and alarm systems, walks, curbs and gutters, storm drainage, and site improvements.

Two alternatives were considered for this new facility. The preferred alternative is located on Burbeck Road across from the Systems Concept Laboratory (Figure 2-13) within the Belvoir Research Development Engineering Command (BRDEC) complex. This area is secured by a fence and had controlled access points.

Alternative 2 is located to the west of the BRDEC (Figure 2-14). This site, however, is not secured and requires utility upgrades to meet the needs of the AMTL.

2.5.4.2.9 Exchange Branch (BRAC 9). This facility will have an approximately 5,500-gross-square-foot building and two gasoline-dispensing islands. This project is required to support the relocation of the AAFES retail sales to Fort Belvoir when Cameron Station closes.

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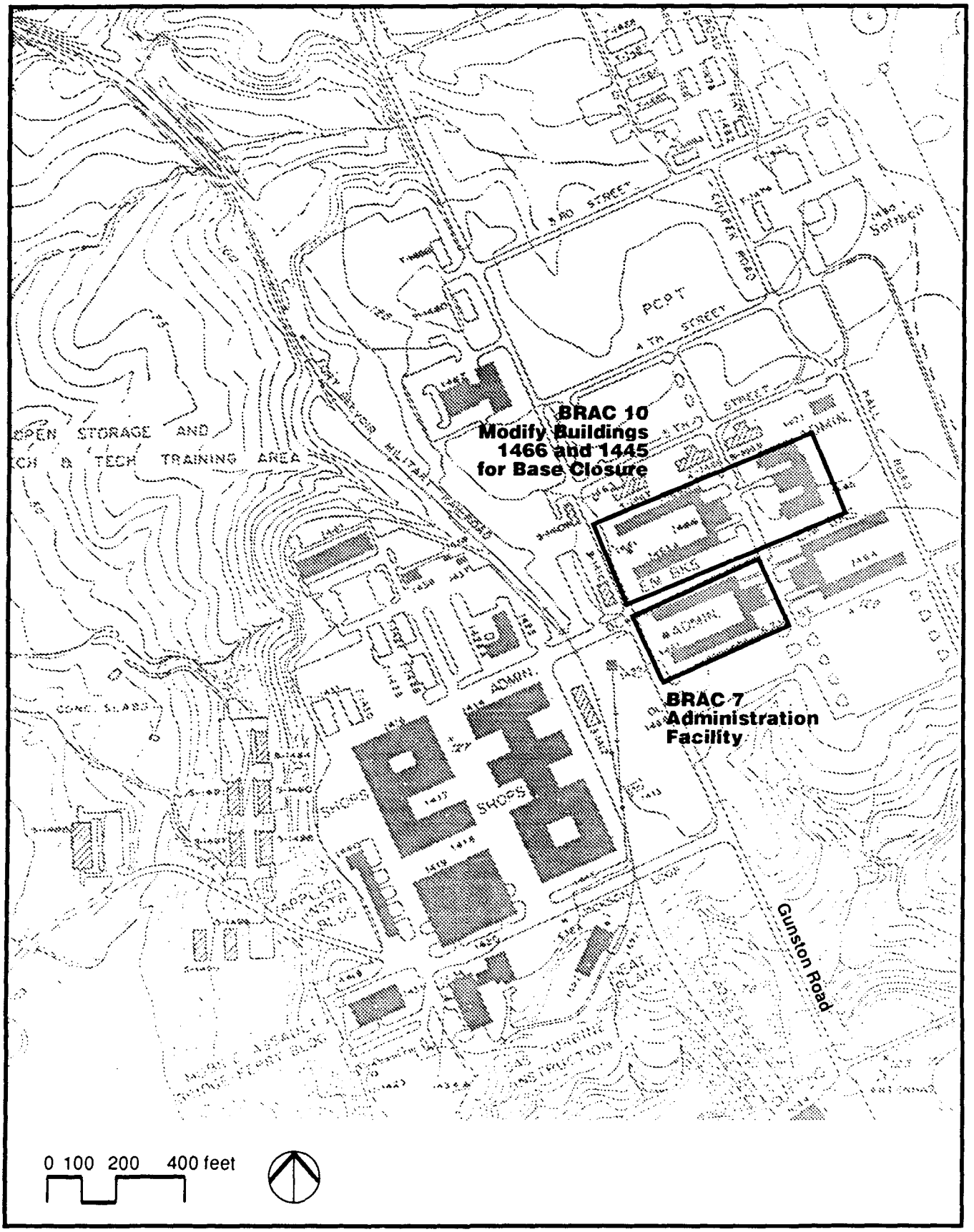


Figure 2-12
BRACs 7 and 10, Preferred Alternatives

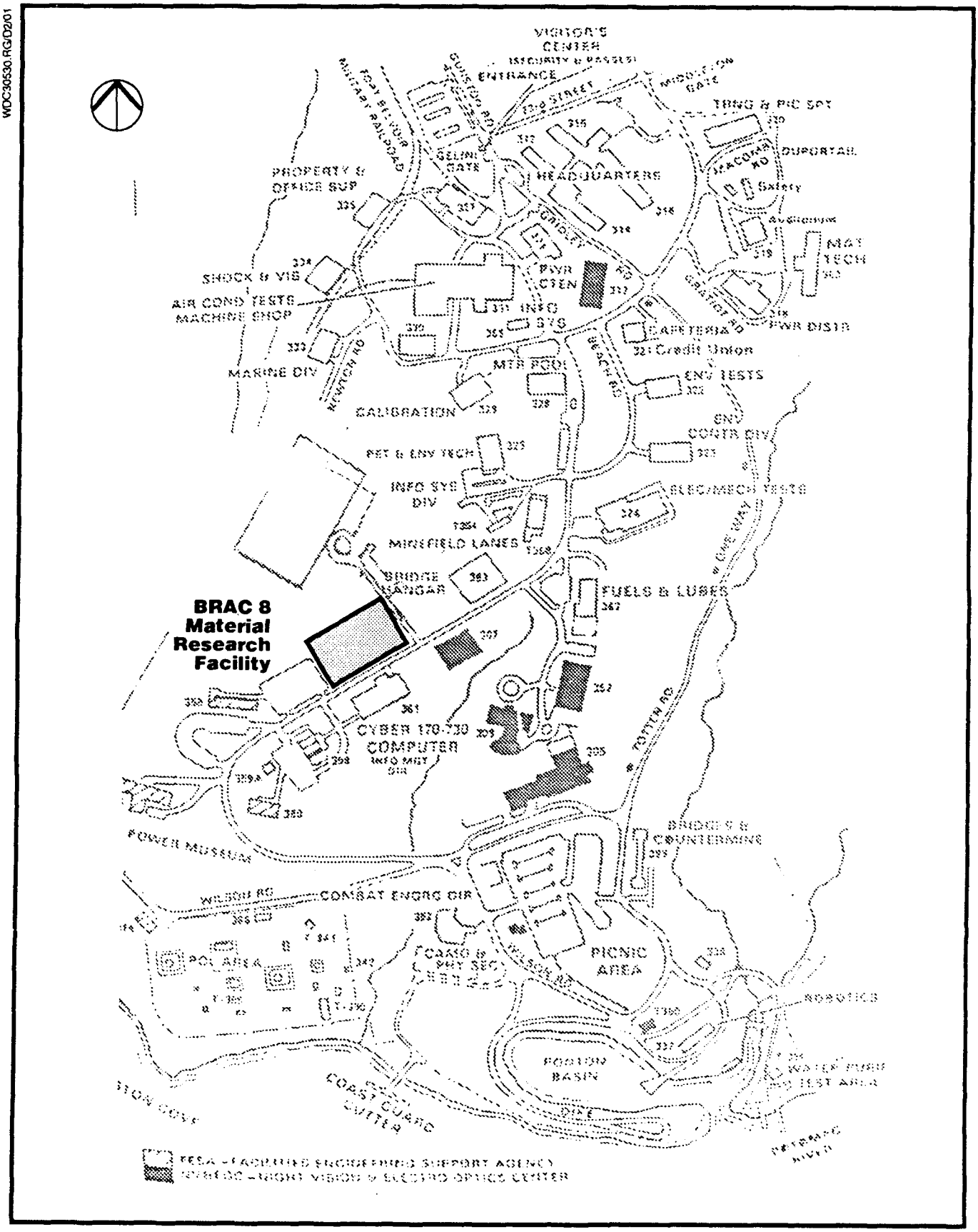


Figure 2-13
BRAC 8, Preferred Alternative

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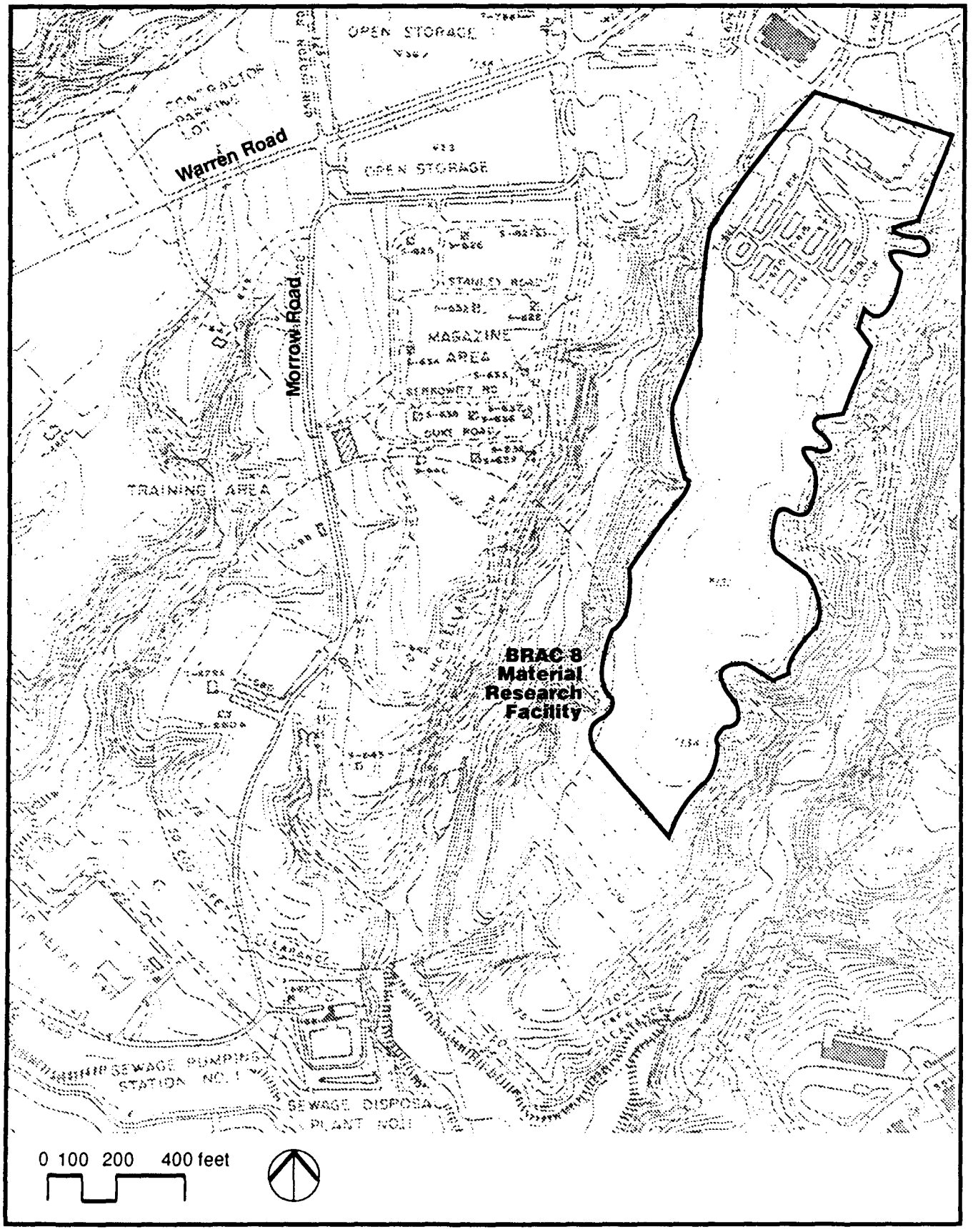


Figure 2-14
BRAC 8, Alternative 2

The preferred alternative for BRAC 9 is located on the North Post (Figure 2-10) along Woodlawn Road, which could be used by military personnel, by their dependents, and by retirees and lessen traffic on a public road. This site would serve those coming to the North Post PX/Commissary complex. The site is disturbed and already has access to utilities.

Alternative 2, also located on the North Post, is next to the commissary (Figure 2-10). This site is also disturbed and has access to utilities. Funding for this project will be provided by AAFES.

2.5.4.2.10 Modify Buildings 1466 and 1445 for Base Closure (BRAC 10). A concise study, conducted in the late 1970s, and a backfill study, conducted in the early 1980s, were used to analyze the known alternatives to modifying the area and buildings being vacated by the Engineer School when it is moved to Fort Leonard Wood, Missouri. All the alternatives, and the environmental impacts of those alternatives, are discussed in these studies. The alternative to move Cameron Station organizations into Building 1466 is based on economics and the requirement for maximum use of existing space. Located on the South Post (Figure 2-12), Building 1466 was originally designed as a barracks and scheduled for open space renovation that is funded under an approved Military Construction Army project. Base closure funds will be used to adjust the interior of the building to provide separate space for each of the agencies being relocated there. Some base closure funds will be required to provide specialized space in Building 1445 for an activity being displaced from Building 1465 because of base closure.

2.5.5 FORT MYER

Four construction projects are planned for Fort Myer as part of BRAC: a PX expansion, a shoppette, a commissary, and a logistics complex. These are described in more detail below.

2.5.5.1 PX Expansion. The main PX at Cameron Station will be closed with the closure of Cameron Station. Some of the patrons will migrate, by preference, to the Fort Myer main PX, which is not large enough to handle additional sales. The current building has limited expansion potential because of the site's topography and the lack of vehicular access for additional patrons. The estimated increase in patronage of 30 percent would increase congestion at the existing facility, reduce the level of service, and create discontented patrons under the no-action alternative. Construction of a new facility could be at the preferred alternative west of the existing PX (Figure 2-15) or near the Army Mutual Aid Building (Figure 2-16). The site west of the existing PX was selected as the preferred alternative because it has ample space for patron parking. The new facility would be approximately 10,000 square feet with an intrusion-detection system. Support facilities will include utilities, paving, sidewalks, curbs and gutters, fire protection and alarm systems, handicapped access, and information systems.

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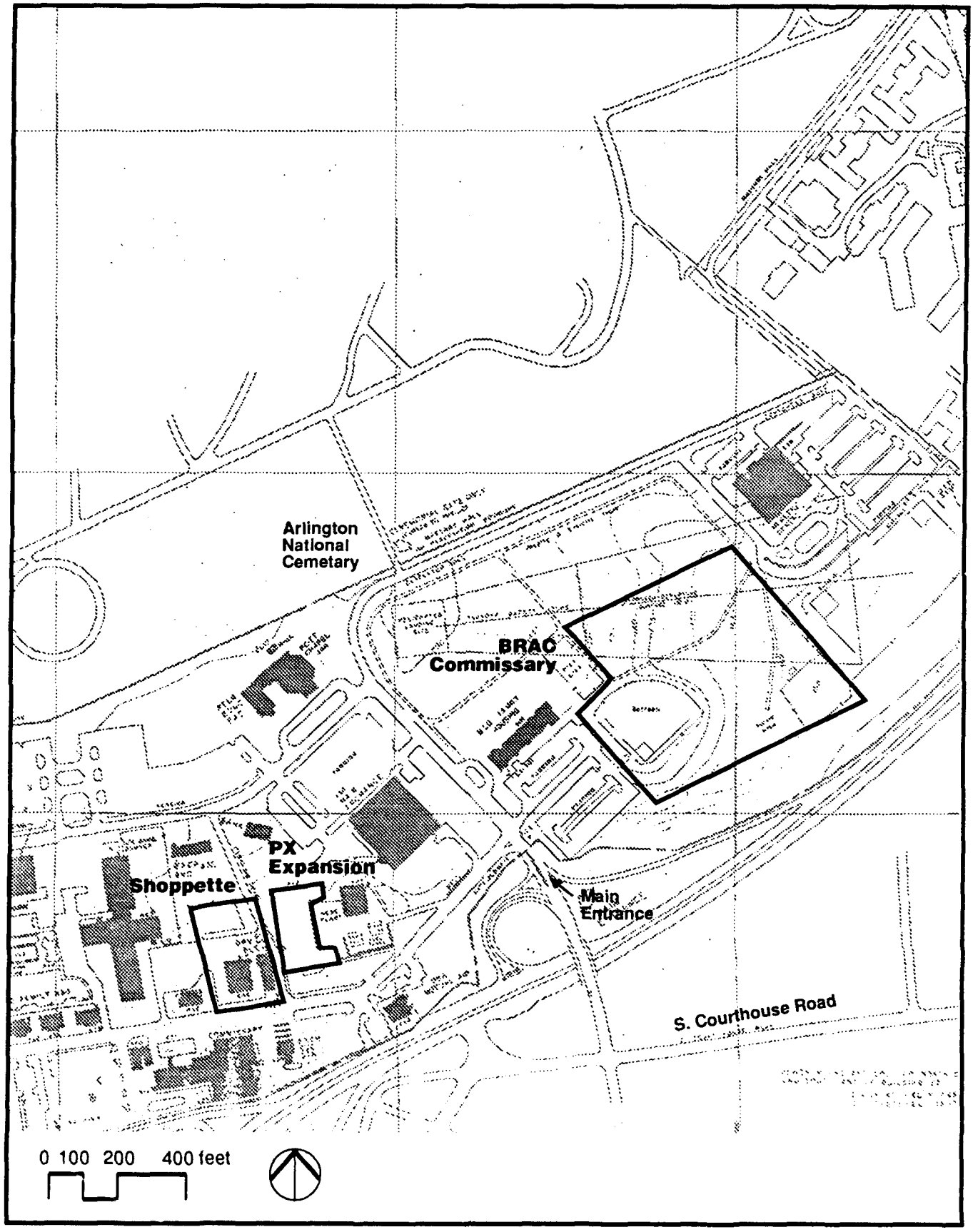


Figure 2-15
Fort Myer BRACs-
Commissary, PX Expansion,
and Shoppette—
Preferred Alternatives

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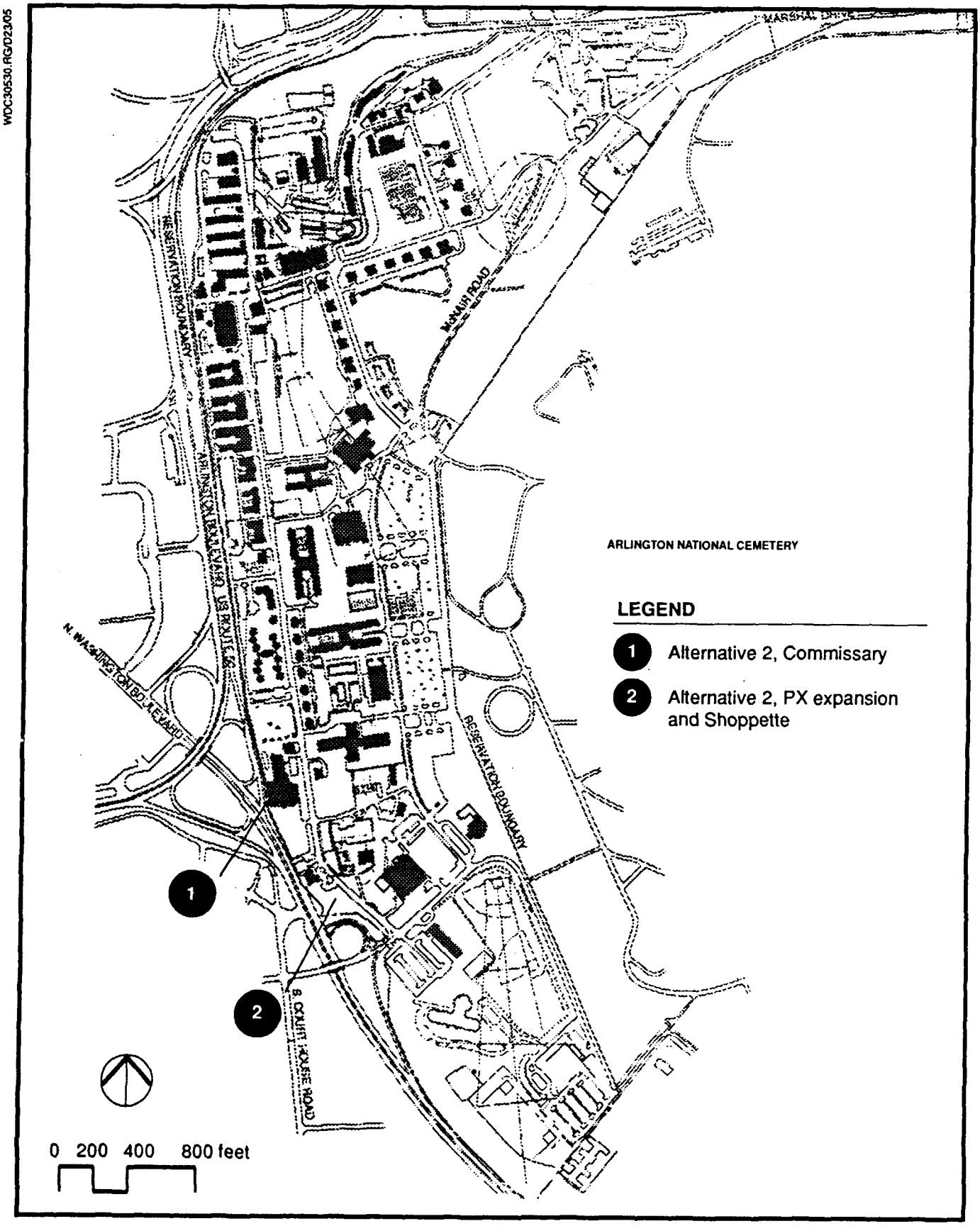


Figure 2-16
Fort Myer BRACs Alternative 2 Commissary, PX Expansion, and Shoppette

2.5.5.2 Shoppette. Because of the Cameron Station closure, a portion of its shoppette business will migrate to the Fort Myer PX, which is not large enough to handle the additional business. The no-action alternative would reduce the level of service and displease the patrons of the current shoppette at Cameron Station. The alternative sites for this project are near those presented for the PX expansion (Figure 2-15 and 2-16). Construction of the shoppette at the preferred site will require the demolition of two existing buildings, the laundry plant and the Tissa warehouse. The shoppette is planned to contain approximately 10,800 square feet of space and will include sales display areas, administration offices, restrooms, a stockroom, receiving area, and a beverage shop. Supporting facilities will include paving, walks, and curbs and gutters with the necessary utilities. BRAC funding will be provided to construct 5,300 square feet of this facility.

2.5.5.3 Commissary. Because of the closure of the Cameron Station, some of the patrons will migrate to the Fort Myer facility. Under the no-action alternative, the existing commissary would not be able to handle the increase in business, which would result in reduced levels of service and discontented patrons. The current, antiquated facilities could not be expanded efficiently or economically to handle the anticipated 30 percent increase in business, therefore, a new facility is required. The new facility could be constructed at a site south of Tenza Terrace (Figure 2-15), the preferred alternative, or at the current location (Figure 2-16). Using the existing site would require the present building to be closed for a period of time up to 24 months. This would result in no service for the patrons and the alternative was rejected. The preferred alternative is to construct a new facility south of Tenza Terrace where patron traffic can be dispersed.

The 86,400-square-foot facility would include areas for sales, checkout, cold and frozen food storage, administration, preparation, employees, backup storage, and a computer room. Construction would include refrigeration with an automatic monitoring-control system, emergency building lighting, and fire sprinkler system. Supporting facilities will include paved access roads and a 450-vehicle parking area for patrons and employees, a visually screened truck loading dock area, sidewalks, utilities, and communications. The present commissary would be demolished, which would include the removal of asbestos.

2.5.5.4 Logistics Complex. Because of the closure of Cameron Station, the MDW Logistics and other activities will be realigned to Fort Myer to provide logistics/ entomology support in proximity to the military and other authorized consumers (e.g., DOD, White House, and State Department) in the NCR. Under the no-action alternative, this support would be lost. Several sites were considered for construction of new facilities. A site at Fort Myer near the Wright Gate is large enough for the necessary warehousing, maintenance facilities, and administration and parking areas for the MDW DCSLOG staff/DOL workforce (Figure 2-17). The complex would also include an entomology shop, a maintenance shop for the 1101st Signal Brigade, and replacement facilities for the four buildings that will be razed to make room for the proposed construction. The complex would not fit in one location at Fort Myer. The storage and service area would be adjacent to the Wright Gate, including the maintenance and

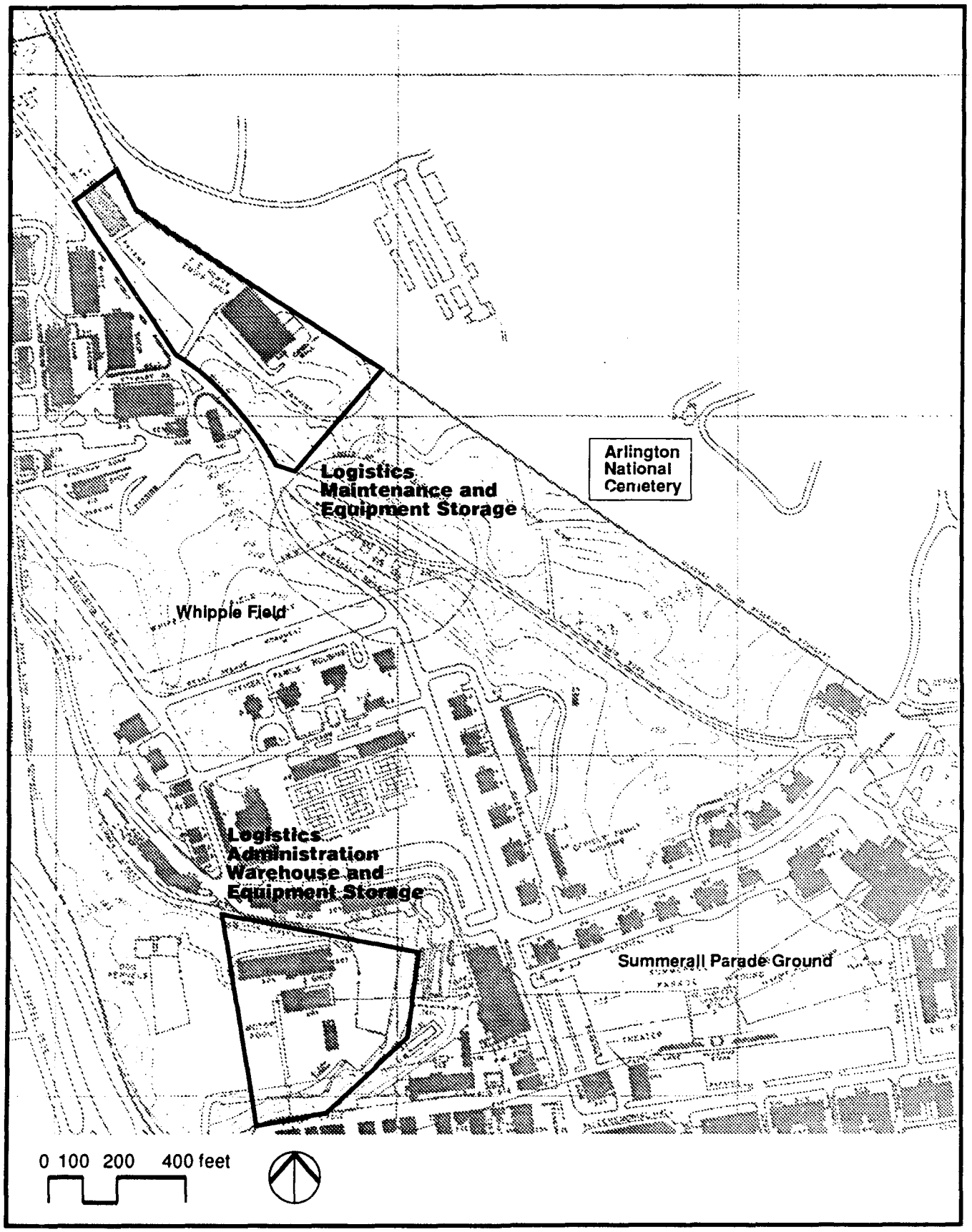


Figure 2-17
Fort Myer BRAC Logistics Complex, Preferred Alternative

entomology shops (8,760 square feet), and a covered parking area for government equipment (4,320 square feet). The other area north of the Officer's Club would provide warehousing (75,609 square feet), administration area (25,600 square feet), and associated parking (approximately 9,500 square feet).

In Alternative 2, Ft. Belvoir was considered for the location of the logistics complex. A site for the complex could be found at Fort Belvoir. However, locating the complex at Fort Belvoir would not be responsive to the consumers. As a result, this alternative was not pursued.

2.5.6 FORT MEADE

The Commission recommended the partial closure of Fort Meade and the relocation of CIDC activities to Fort Belvoir. These activities may be relocated to space vacated by the ISC, which will relocate to Fort Devens, Massachusetts.

2.5.7 FORT HOLABIRD

The Commission also recommended the closure of the portion of Fort Holabird occupied by the CRC. The CRC activity will be moved to Fort Belvoir and consolidated with the other CIDC activities being realigned to Fort Belvoir.

2.6 FORT BELVOIR CONCEPT DEVELOPMENT PLAN

2.6.1 INTRODUCTION

This EIS addresses the environmental impacts for the Fort Belvoir CDP so they can be considered in conjunction with the effects of the base realignment and closure actions.

Potential sites for the many projects proposed at Fort Belvoir have been identified by Fort Belvoir planners. The alternatives for these projects include changes in final siting, as well as the initiation of the project. An evaluation of environmental constraints will be used to determine the actual locations, or the "footprints", for proposed projects. The location within a site and the actual site can change. New sites will also be considered if they are consistent with the goals and objectives of the Fort Belvoir Master Plan, which is scheduled for completion in fiscal year 1992. Additional NEPA analyses will be made of these actions, if appropriate. These analyses will provide specific discussions of the alternatives for each project. The Fort Belvoir Master Plan will be revised to include the CDP and appropriate NEPA analyses beginning in fiscal year 1991.

Preliminary descriptions of the proposed actions for the Concept Development Plan are included below. The actions are divided into four categories, Military Construction Activity (MCA), NAF, AAFES, and Army Family Housing (AFH). MCA 1 through 5 and AFH 1 are currently under construction and will only be briefly described.

2.6.2 MILITARY CONSTRUCTION ACTIVITY

2.6.2.1 Child Development and Religious Education Centers (MCA 1a and MCA 1b). A combination child development center and religious education center (MCA 1a) is under construction on the South Post, west of the post chapel on 12th Street. This facility will provide approximately 29,000 square feet of space for child care and religious education. A second child development center (MCA 1b) is also under construction on the North Post, south of Meeres Road and east of Cheney School. It will provide approximately 22,500 square feet of space for child care. Appropriate environmental analysis was completed for both of these projects before construction began.

2.6.2.2 Electronics Supply and Maintenance Facility (MCA 2). The Electronics Supply and Maintenance Facility is being constructed on the South Post between Pratt and Thoete Roads. This construction project is part of the post-wide upgrade of electrical service required for the planned BRAC and CDP actions. Appropriate environmental documentation was completed for this project before construction began.

2.6.2.3 Washington, D.C., Army National Guard Armory (MCA 3). The Washington, D.C., Army National Guard is building an armory at Davison Airfield south of the northwest end of the runway. Appropriate environmental documentation was completed for this project before construction began.

2.6.2.4 Washington, D.C., Army National Guard Aircraft Parking Apron (MCA 4). Also under construction at Davison Airfield is the Washington, D.C., Army National Guard Aircraft Parking Apron. This facility is located to the northwest of the existing runway. Appropriate environmental documentation was completed for this project before construction began.

2.6.2.5 Convert Buildings 206 and 208 to Classrooms (MCA 5). Buildings 206 and 208 are currently being converted to classrooms to fulfill the Defense Systems Management College requirements. Appropriate environmental documentation was completed for this project before construction began.

2.6.2.6 Veterinary Clinic (MCA 6). A new veterinary clinic is proposed for construction on the South Post at the intersections of Thoete, Warren, and Clapp Roads (Figure 2-18). The facility will be a one-story structure and contain approximately 6,400 square feet of space. The facility is required in order to replace the original veterinary clinic lost to fire in 1986. This project is programmed, but not yet funded. A record of environmental considerations (REC) has been prepared for this project.

2.6.2.7 Operations Building Renovation, Engineer School Backfill (MCA 7a, 7b, and 7c). The renovation of operations buildings as part of the Engineer School Backfill (Figures 2-19, 2-20, and 2-21) involves the renovation of Buildings 201 (MCA 7a); 247 (MCA 7b); and 1464, 1455, and 1466 (MCA 7c). It also involves the construction of chiller buildings at Building 1400; the construction of handicapped parking and

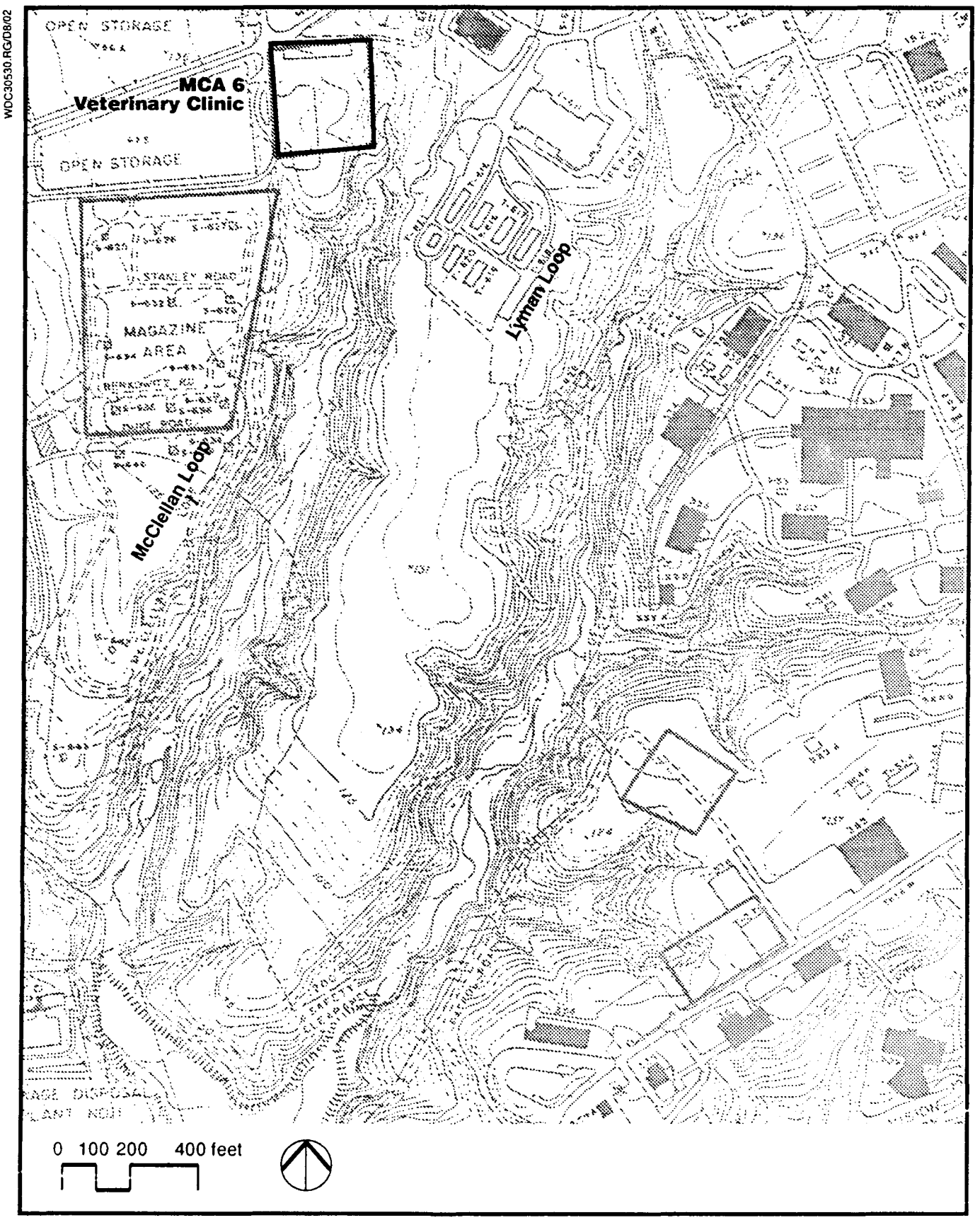


Figure 2-18
Proposed MCA Site 6

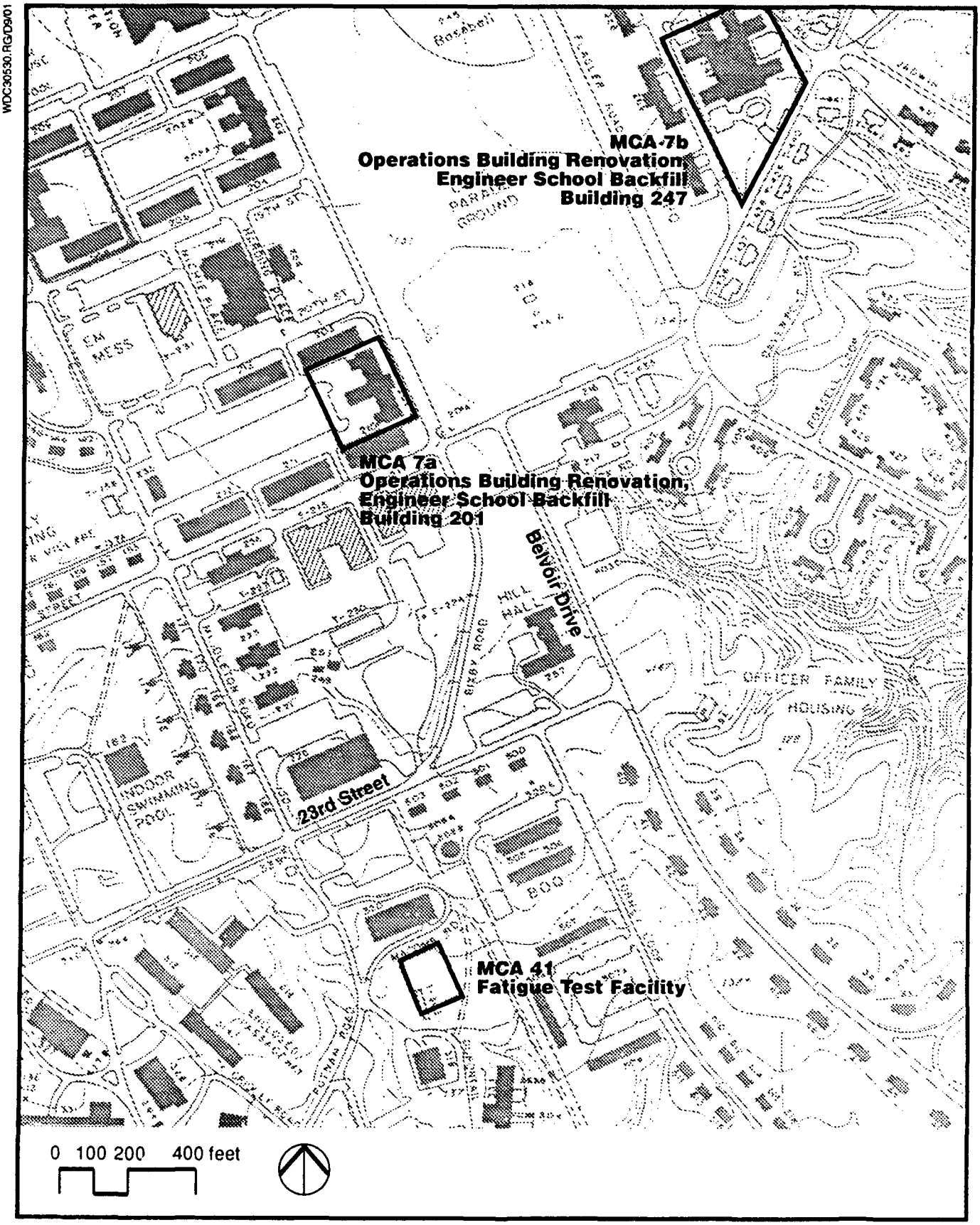


Figure 2-19
Proposed MCA Sites 7a, 7b, and 41

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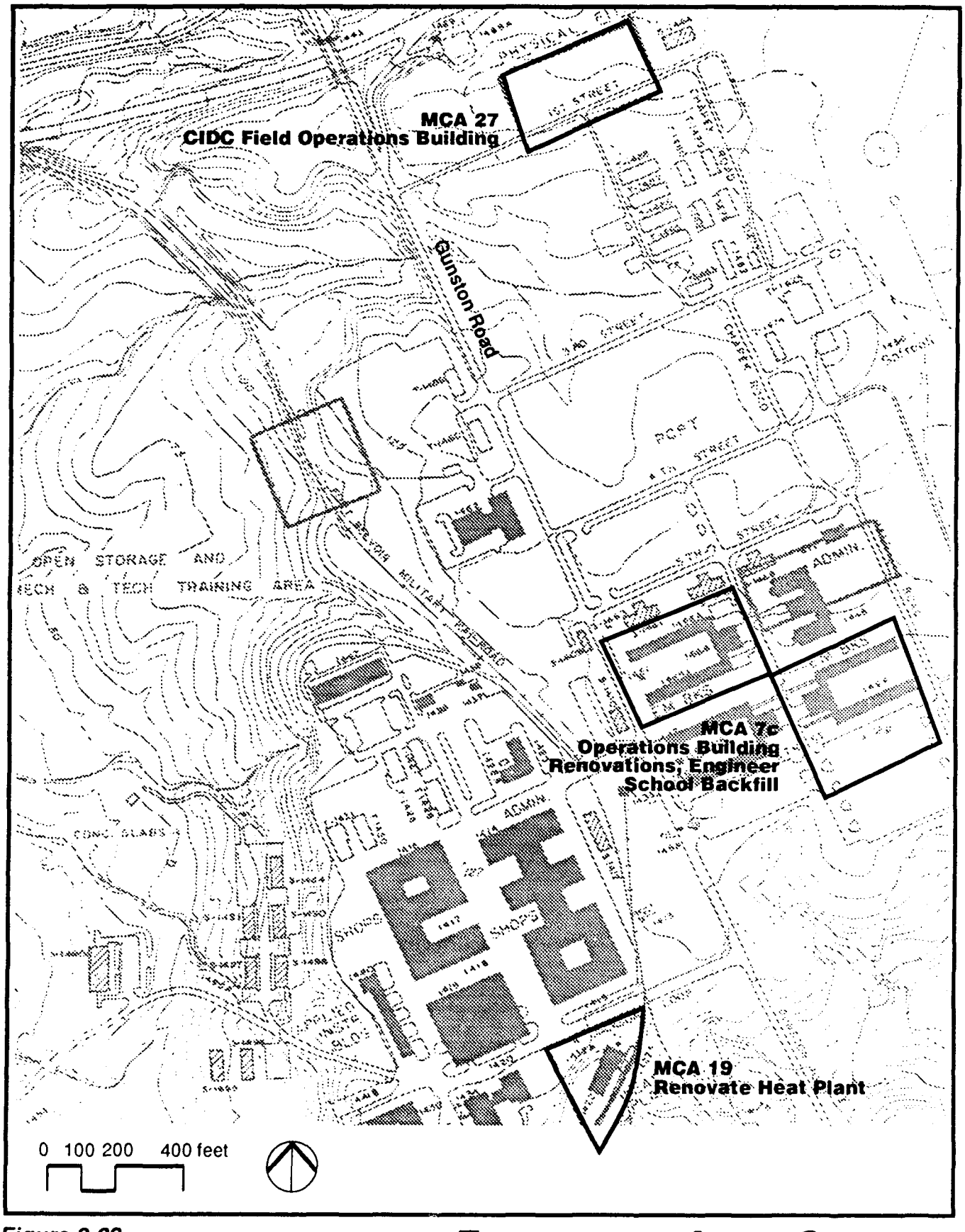


Figure 2-20
Proposed MCA Sites 7c,19, and 27

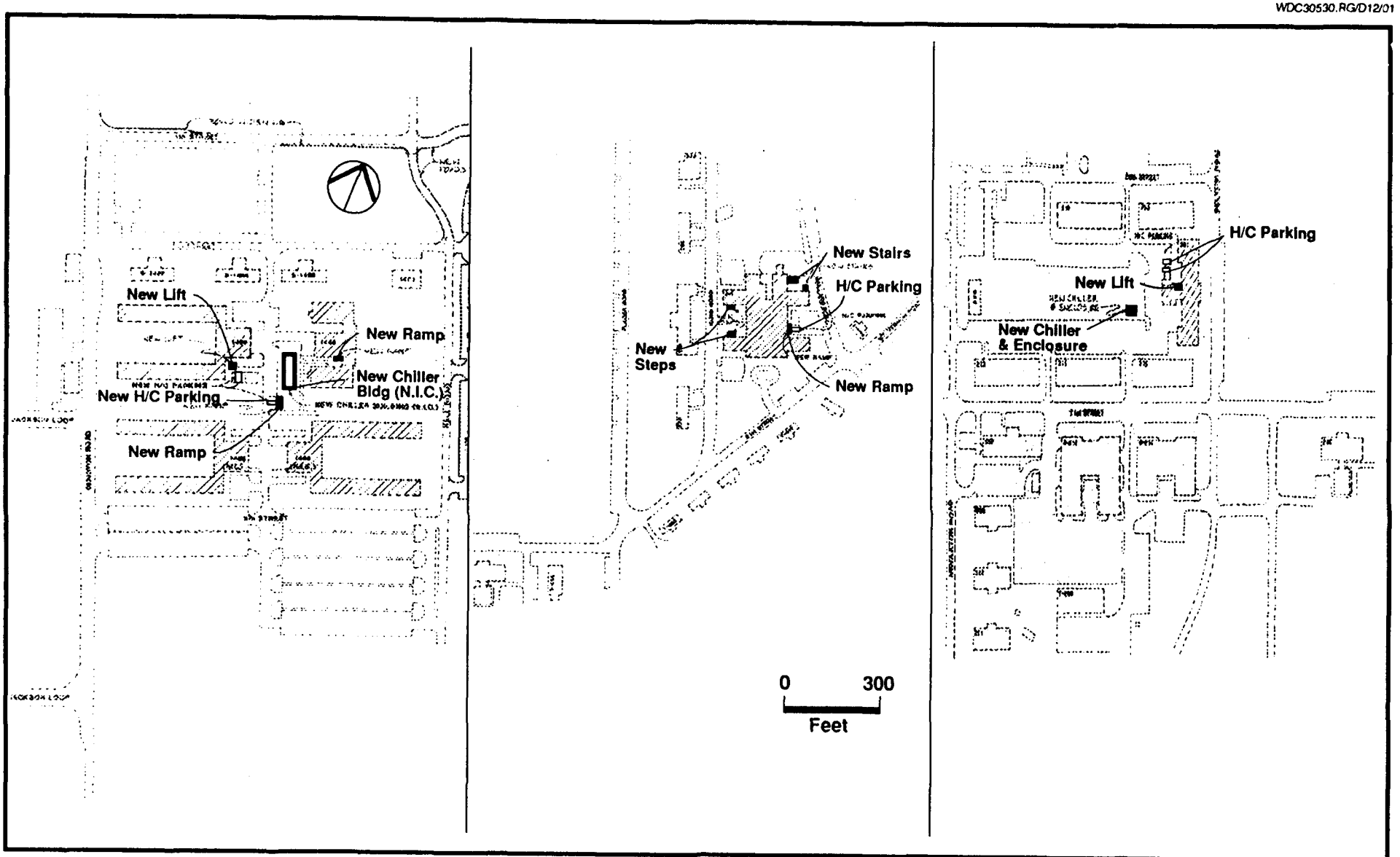


Figure 2-21
Development of Proposed MCA Sites 7a, 7b, and 7c

access ramps at all of the buildings; construction of new lifts at Buildings 201 and 1464; and the construction of new stairs at Building 247. The renovated space in these buildings will be used to house various administrative functions. This project is funded, but not yet under construction. An environmental assessment titled *U.S. Army Engineer Center and Fort Belvoir* was completed in August 1983 for this project.

2.6.2.8 Telephone Switch Upgrade, Post-Wide (MCA 8). A post-wide telephone switch upgrade is planned for accommodating future growth at Fort Belvoir. Once completed, the electronic switching system will have a capacity of approximately 33,000 lines. This project is programmed, but not yet funded. This project should qualify for a categorical exclusion under NEPA.

2.6.2.9 Fixed-Wing Runway Extension (MCA 9). The Fixed-Wing Runway Extension will provide additional margins of safety for takeoffs and landings at Davison Airfield (Figure 2-22). An environmental assessment has been completed for this project. This project is programmed, but not yet funded. An environmental assessment titled *Environmental Assessment: Runway Extension Davision Army Airfield* was completed in January 1987 for this project.

2.6.2.10 Old Guard Horse Stables (MCA 10). The Old Guard Horse Stables is sited for the South Post near the intersection of Richmond Highway and Old Colchester Road, north of Poe Road (Figure 2-23). The stable area will provide shelter and pasture for Old Guard horses from Fort Myer. This project has not been programmed, funded, or approved to date. An REC has been completed for this project.

2.6.2.11 Main Sewer Line Upgrade, Post-Wide (MCA 11). Post-wide upgrades of the main sewer lines are planned at Fort Belvoir. When completed, the upgraded sewer mains will accommodate the increased sewage flows generated as a result of growth at Fort Belvoir. This project is programmed, but not yet funded. An REC has been completed for this project.

2.6.2.12 North Post Fire Station (MCA 12). An 8,400-square-foot, two-company fire station is planned for the North Post inside Frazier Loop, north of Abbott Road (Figure 2-24). The station will comprise three drive-thru bays, one of which will accommodate an aerial ladder truck. The station will improve the effectiveness of the fire protection at Fort Belvoir by decreasing response time to North Post areas. This project is programmed, but not yet funded. An REC has been completed for this project.

2.6.2.13 Headquarters, Air Force Intelligence Agency (MCA 13). A three-building headquarters complex providing approximately 140,000 square feet of space is being planned for the Air Force Intelligence Agency northeast of the BRAC 1 site (Figure 2-25). The facility will be constructed in two phases. It will contain space for a security and visitor-control area, headquarters squadron section, restrooms, command

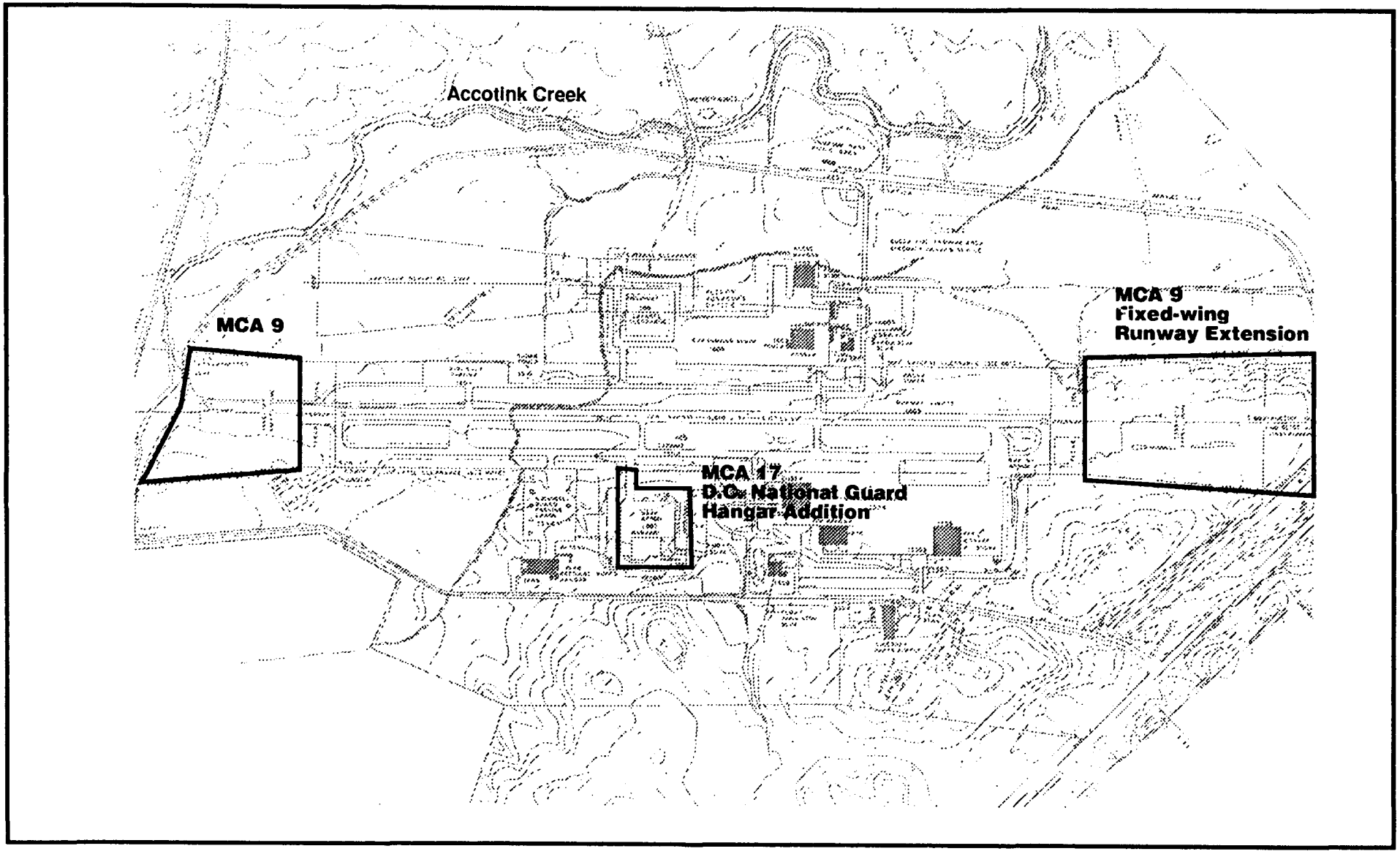


Figure 2-22
Proposed MCA Sites 9 and 17

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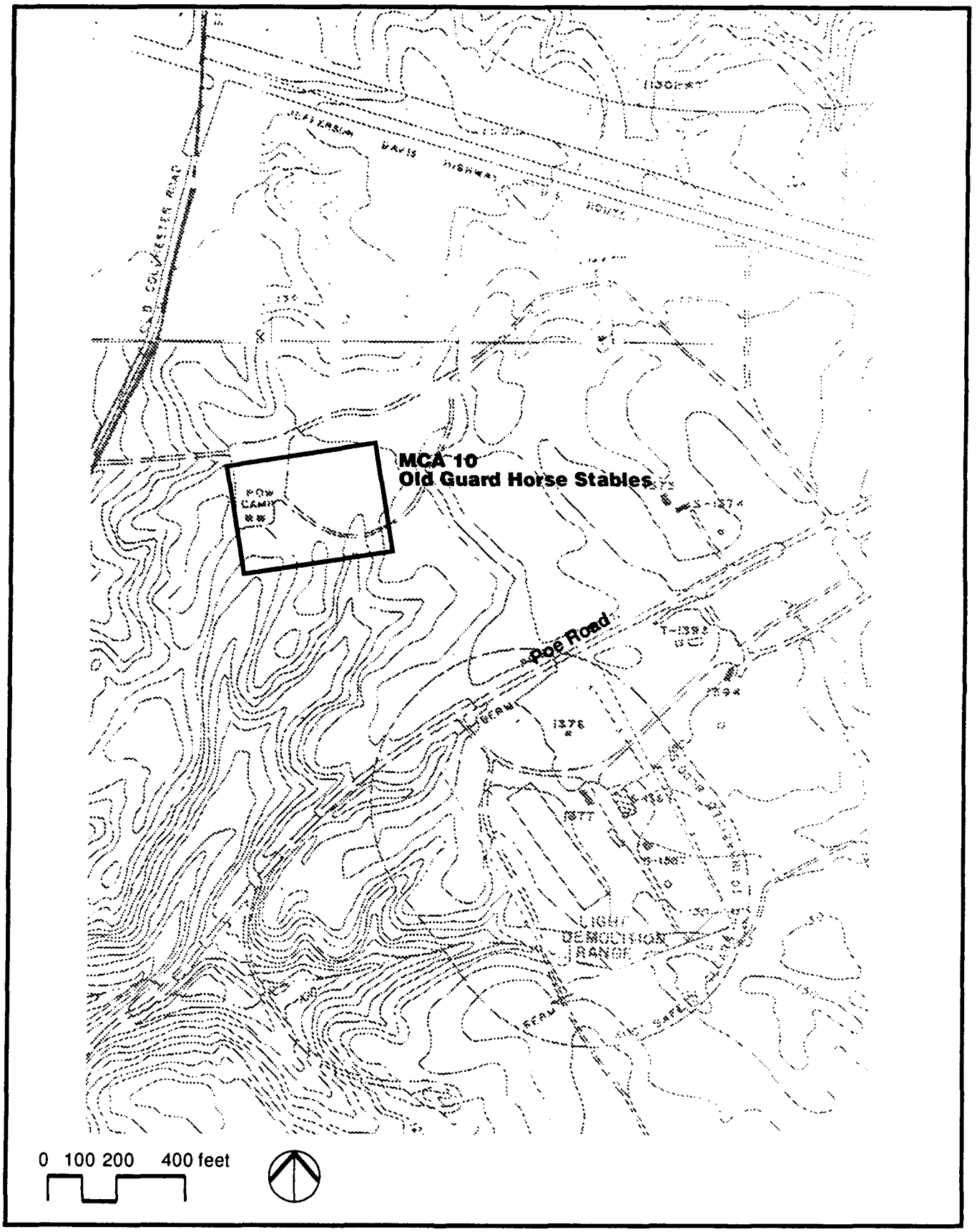


Figure 2-23
Proposed MCA Site 10

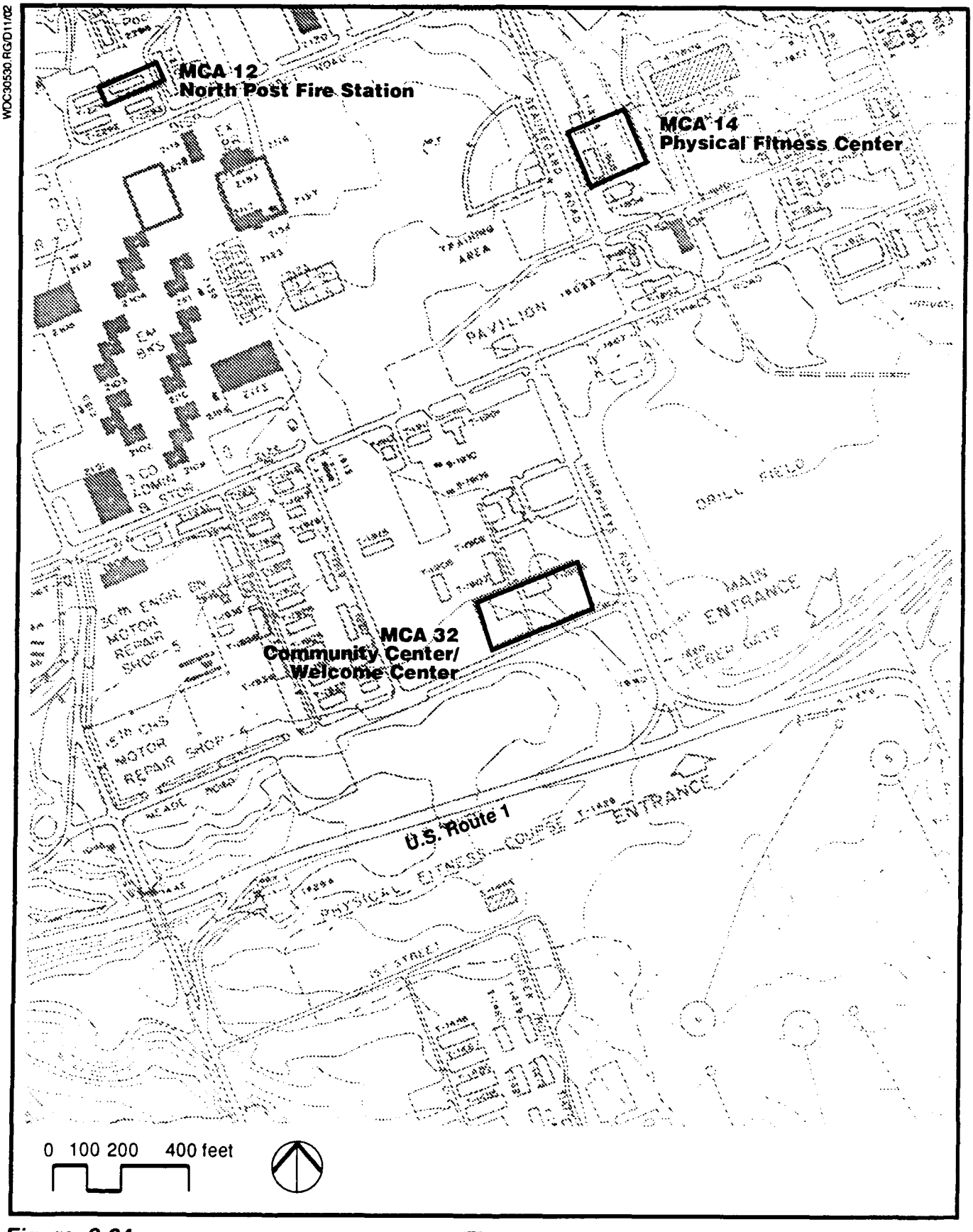


Figure 2-24
Proposed MCA Sites 12, 14, and 32

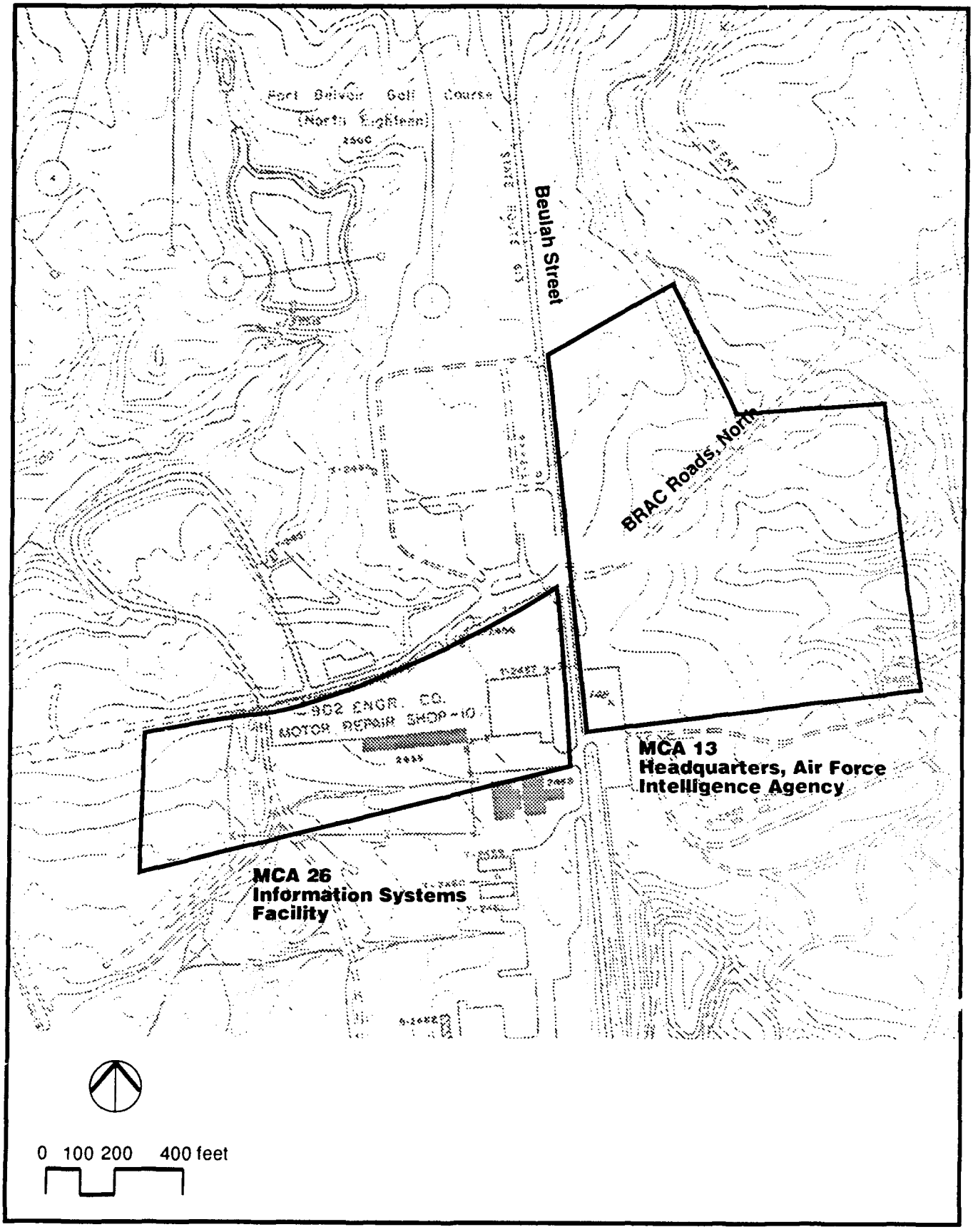


Figure 2-25
Proposed MCA Sites 13 and 26

group area, command conference center, and mechanical and janitorial rooms. MCA 13 will house the Directorates of Targets; Intelligence Data Management; Communications/Computer Systems Division; Security and Communications; Joint Services Support; Research and Soviet Studies; and the sensitive compartmented information facility for the Historical Research Office and the Directorate of Research and Soviet Studies. Parking for approximately 420 vehicles will also be provided. This project is programmed, but not yet funded. The environmental assessment for this project is in progress.

2.6.2.14 Physical Fitness Center (MCA 14). A physical fitness center is planned for North Post east of Beauregard Road between Abbott and Goethals Roads (Figure 2-24). The building will provide approximately 27,000 square feet for physical fitness facilities for on-post military personnel. This project is programmed, but not yet funded. An REC has been completed for this project.

2.6.2.15 Virginia Army National Guard Armory/Headquarters (29th Light Infantry Division) (MCA 15). An armory to house the Virginia National Guard, 29th Light Infantry Division, is being planned for the North Post between Accotink Village and Backlick Road (Figure 2-26). The armory will house approximately 400 people and provide approximately 87,000 square feet of space. This project is programmed, but not yet funded. The environmental assessment for this project is in progress.

2.6.2.16 Gunston Road Extension (MCA 16). Fort Belvoir is planning to improve Gunston Road and extend it northward from its current terminus at Abbott Road to the planned BRAC Roads (Figure 2-27). The final alignment of the extension has not yet been determined. When completed, the upgrades and extension should accommodate future planned development in the vicinity. This project is programmed, but not yet funded. The environmental assessment for this project is in progress.

2.6.2.17 Washington, D.C., Army National Guard Hangar Addition (MCA 17). The Washington, D.C., Army National Guard hangar addition is planned in order to provide an additional 12,948 square feet of hangar space at Davison Airfield (Figure 2-22). This project is programmed, but not yet funded. No environmental documentation has been completed for this project. Appropriate analysis will be completed before construction begins.

2.6.2.18 Seabee Operational Storage Facility (MCA 18). The Seabee Operational Storage Facility is planned for the North Post south of Stuart Road, between Meade and Foster Roads (Figure 2-28). The facility will have approximately 4,000 square feet of general storage space for equipment and supplies. This project is funded, but not yet constructed. This project will qualify for a categorical exclusion.

2.6.2.19 Renovate Heat Plant (MCA 19). The heat plant located south of Jackson Loop and west of Gunston Road on the South Post (Figure 2-20) is scheduled to be renovated and upgraded. When completed the plant should be more efficient and emissions will be reduced. This project is programmed, but not yet funded. An REC has been completed for this project.

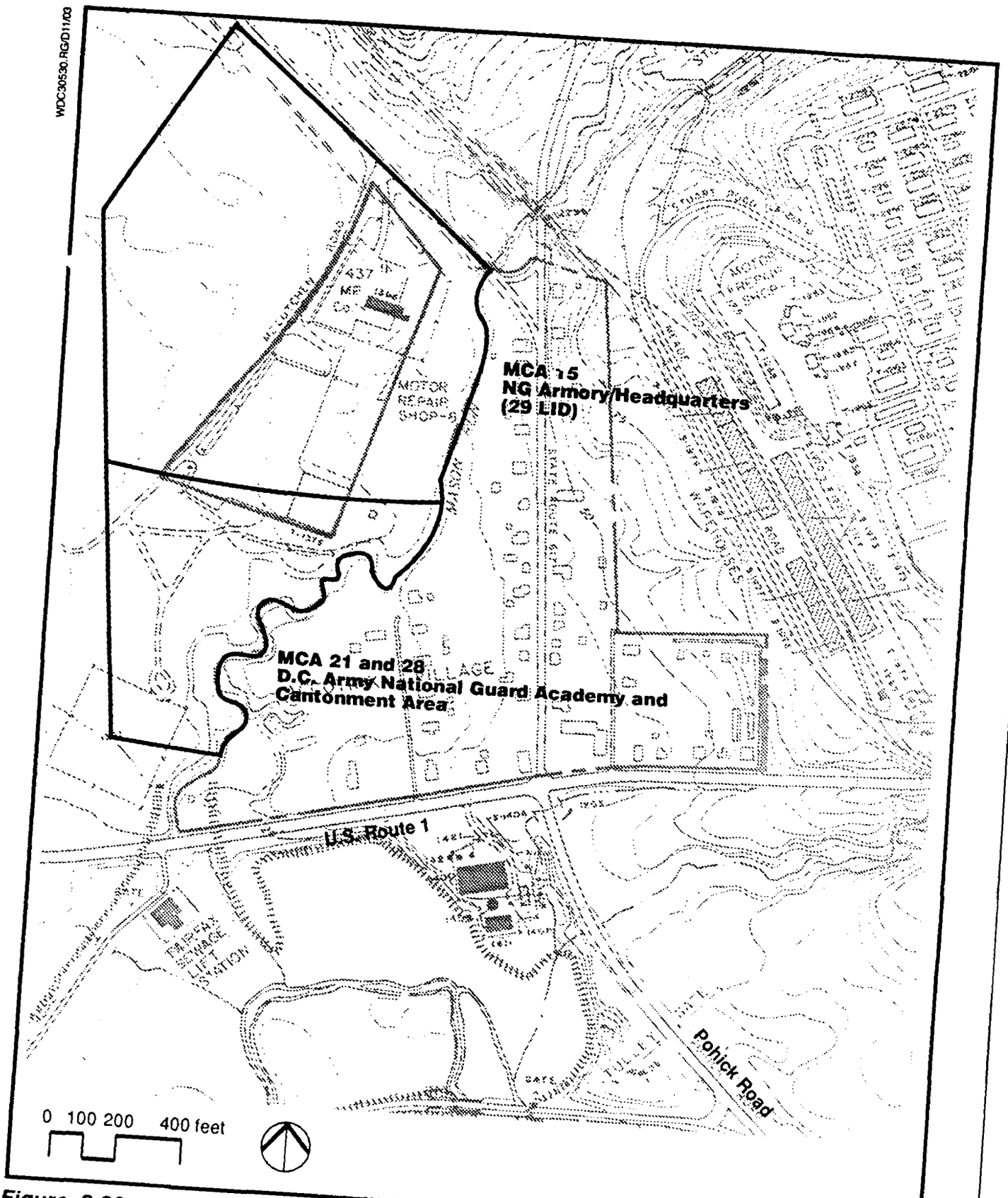


Figure 2-26
Proposed MCA Sites 15, 21, and 28

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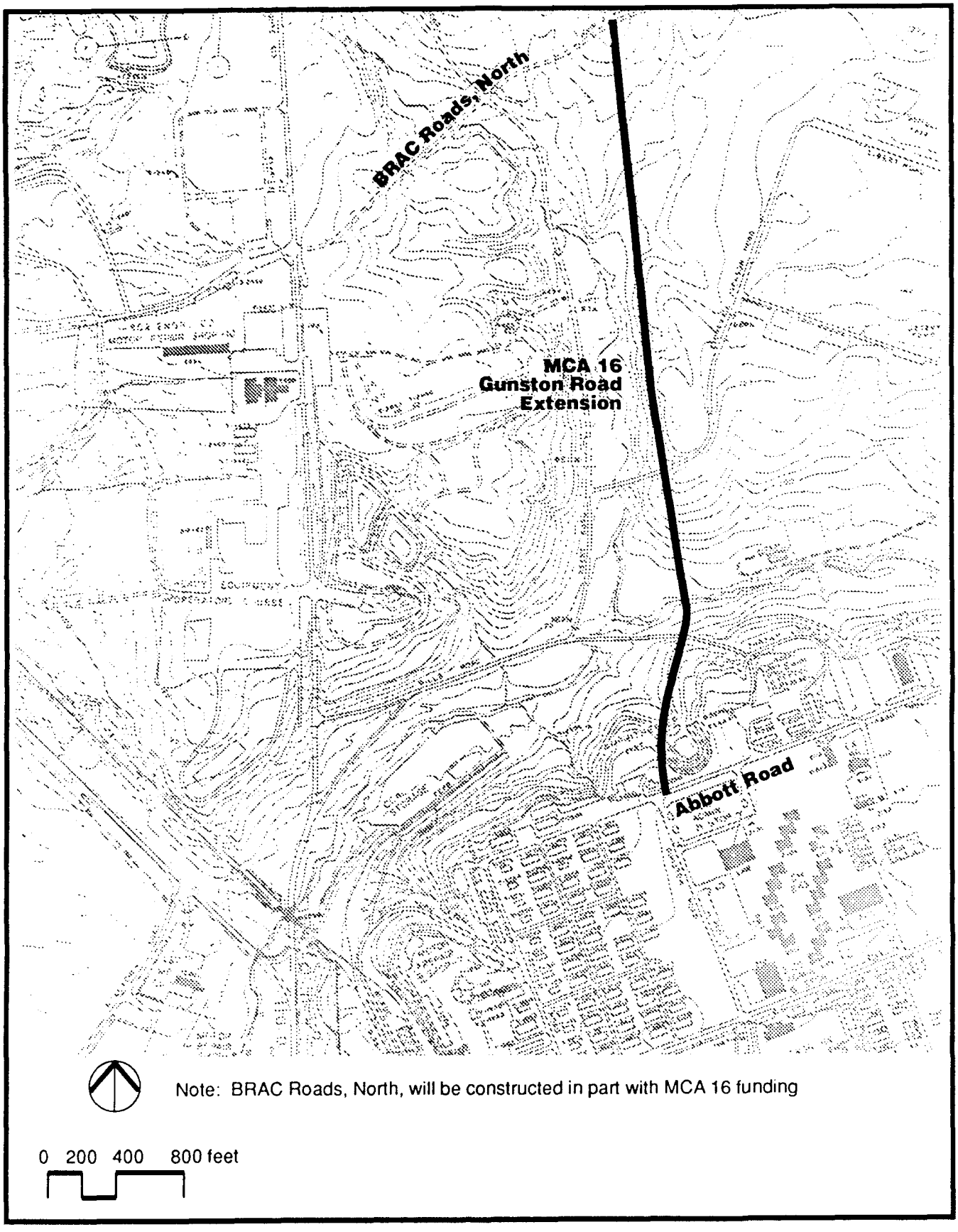


Figure 2-27
Proposed MCA Site 16,
Gunston Road Extension

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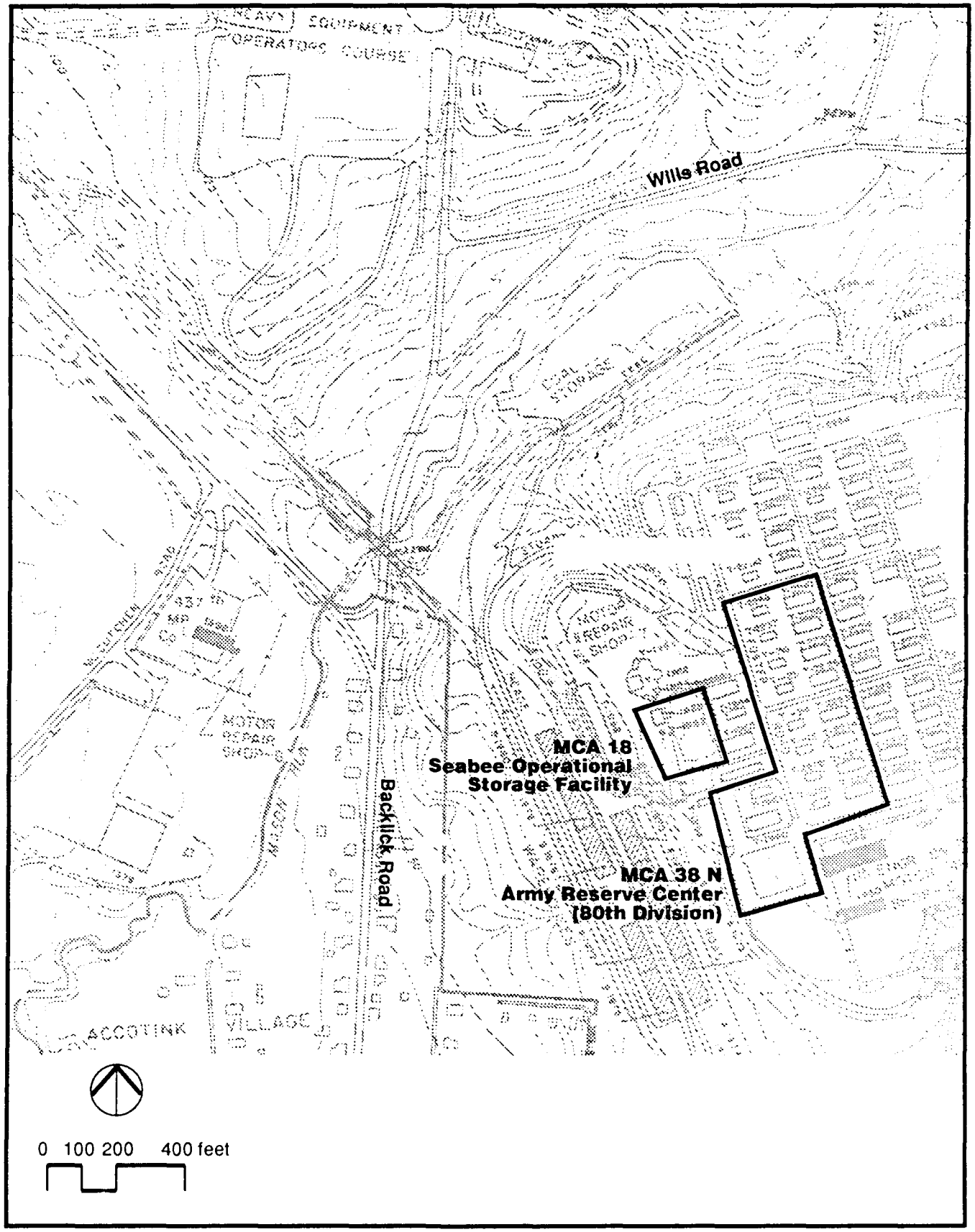


Figure 2-28
Proposed MCA Sites
18 and 38 N

2.6.2.20 Renovate Building 361 for ADP (MCA 20). Building 361 is scheduled to be renovated to meet the requirements for automatic data processing. As part of the renovation, a two-story, 11,200-square-foot addition will be constructed onto Building 361 (Figure 2-29). This project is programmed, but not yet funded. An REC has been completed for this project.

2.6.2.21 Washington, D.C., Army National Guard Academy (MCA 21). The Washington, D.C., Army National Guard Academy is planned for north of Richmond Highway, between the proposed Fairfax County Parkway and Accotink Village (Figure 2-26). This project is programmed, but not yet funded. No environmental documentation has been completed for this project. Appropriate documentation will be completed before construction begins.

2.6.2.22 Electrical Upgrade, Post-Wide, Phase I (MCA 22). A post-wide electrical upgrade is planned for Fort Belvoir. The upgrade will be constructed in eight phases and is scheduled to be completed in fiscal year 1997. The upgrade involves replacing the existing system of multiple voltages (2.4, 4.16, 12.47, 22.9, and 34.5 kilovolts) with a uniform distribution voltage of 34.5 kilovolts. When completed, the new electrical system will be able to provide power for all of the planned future growth at Fort Belvoir, as well as minimize and localize blackout periods. This project is programmed, but not yet funded. A REC has been completed for this project.

2.6.2.23 Lateral Sewer Line Repair, Post-Wide (MCA 23). A post-wide lateral sewer line repair is planned for Fort Belvoir as part of ongoing maintenance. This project is programmed, but not yet funded. A categorical exclusion has been completed for this project.

2.6.2.24 Relocate EPG Test/Storage Facilities (MCA 24). Because of the proposed reuse of the EPG, the existing test and storage facilities will be relocated to the South Post to a plateau south of Lyman Loop (Figure 2-30). The facilities will include a detection equipment facility, exterior sensor range, igloo storage, test NATO bunker, blast and sphere pit, instrumentation building, explosive handling and preparation building, mine clearing and detection area, indoor storage, tilt-table test facility, and scale-model facility. The project will be funded with the proceeds from the EPG development. No environmental documentation has been completed for this project. Appropriate documentation will be completed before construction begins.

2.6.2.25 Ammunition Storage Facility (MCA 25). The Ammunition Storage Facility is planned for the South Post west of Accotink Bay Wildlife Refuge and well south of Poe Road (Figure 2-31). Space will be provided for uncovered loading docks, 10 individual storage areas, security fencing, lighting, ammunition distribution, and security system. A gravel area for loading and unloading trucks will also be provided. The project also includes the upgrade of the existing roadway to provide access to the site. This facility is required to meet current ammunition storage standards and to replace outmoded existing facilities. This project is programmed, but not yet funded. No environmental documentation has been completed for this project. Appropriate documentation will be completed before construction begins.

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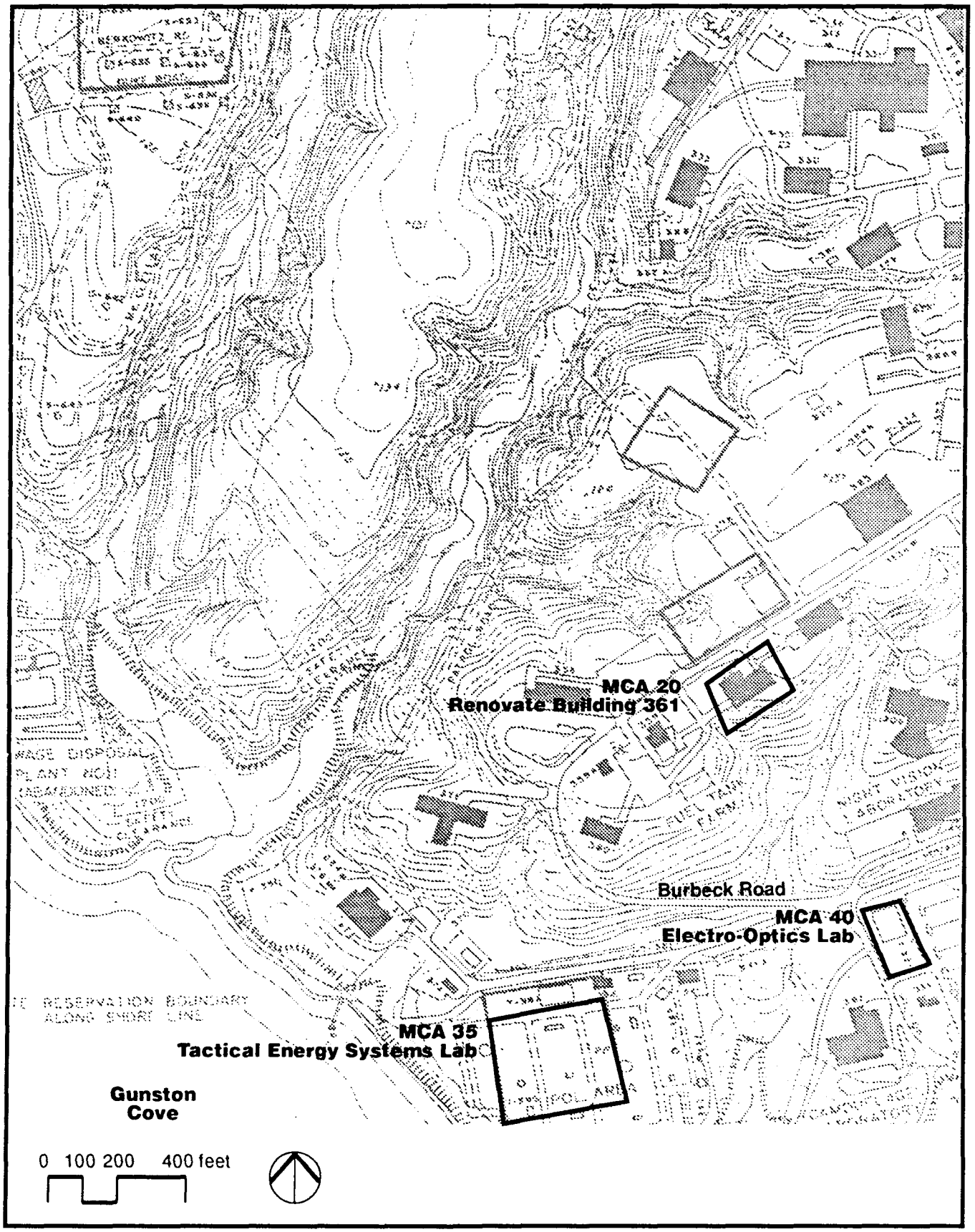


Figure 2-29
Proposed MCA Sites 20, 35, and 40

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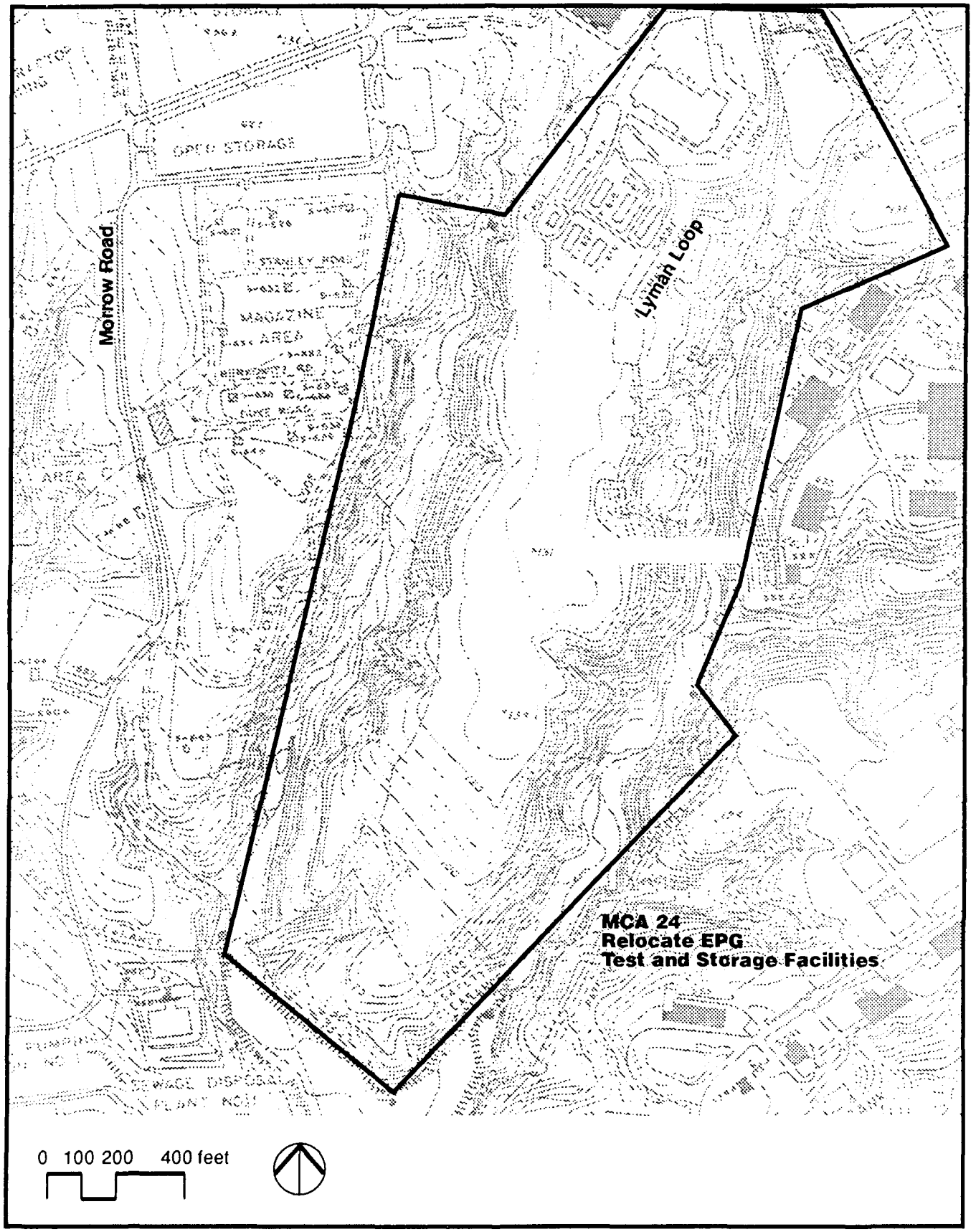


Figure 2-30
Proposed MCA Site 24

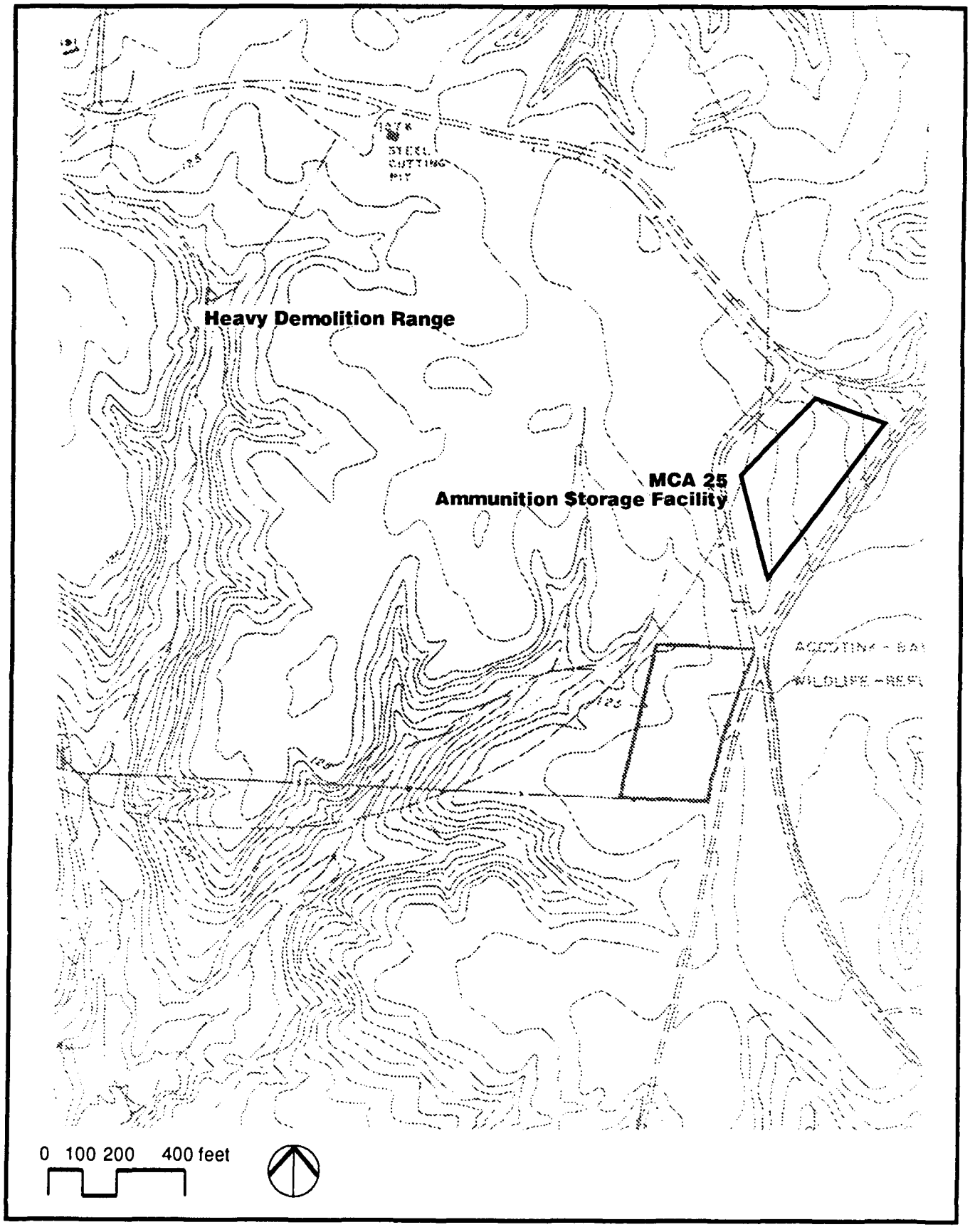


Figure 2-31
Proposed MCA Site 25

2.6.2.26 Information Systems Facility (MCA 26). The Information Systems Facility is planned for the northwest corner of the intersection of BRAC Roads and Beulah Street (Figure 2-25). The facility will contain approximately 93,000 square feet. This project is programmed, but not yet funded. No environmental documentation has been completed for this project. Appropriate documentation will be completed before construction begins.

2.6.2.27 CIDC Field Operations Building (MCA 27). The CIDC Field Operations Building is planned to be constructed between 1st and 3rd Streets, east of Gunston Road (Figure 2-20). The facility will contain approximately 8,300 square feet of space. This project is programmed, but not yet funded. No environmental documentation has been completed for this project. Appropriate documentation will be completed before construction begins.

2.6.2.28 Washington, D.C., Army National Guard Cantonment Area (MCA 28). The Washington, D.C., Army National Guard Cantonment Area is planned for north of Richmond Highway, between the proposed Fairfax County Parkway and Accotink Village (Figure 2-26), near MCA 21. This project is programmed, but not yet funded. No environmental documentation has been completed for this project. Appropriate documentation will be completed before construction begins.

2.6.2.29 Main Post Library (MCA 29). A new Main Post library is planned to be constructed on the South Post east of Gunston Road, south of the South Post shopping area (Figure 2-32). This structure will replace the existing library, which was originally constructed as a handball court. The new library will have approximately 31,000 square feet of space for stacks; reference areas; rooms for audiovisual and computer services, studying, children's books, and periodicals; staff offices, maintenance areas for book repair, material receiving area, restrooms, and a covered loading dock. This project has not been programmed, funded, or approved to date. No environmental documentation has been completed for this project. Appropriate documentation will be completed before construction begins.

2.6.2.30 (MCA 30). No project was designated MCA 30.

2.6.2.31 Loop Road (MCA 31). The Loop Road is planned for construction as a service road to the South Post industrial areas and as a connector to the Fairfax County Parkway. The current proposed alignment is shown on Figure 2-33. The road is planned to be three to four lanes wide and should help move commuters into and out of the South Post of Fort Belvoir more efficiently when completed. This project is programmed, but not yet funded. No environmental documentation has been completed for this project. Appropriate documentation will be completed before construction begins.

2.6.2.32 Community Center/Welcome Center (MCA 32). The Community Center/ Welcome Center is currently planned for the North Post of Fort Belvoir at the intersection of Meade and Humphreys Roads (now Constitution Road), north of Richmond

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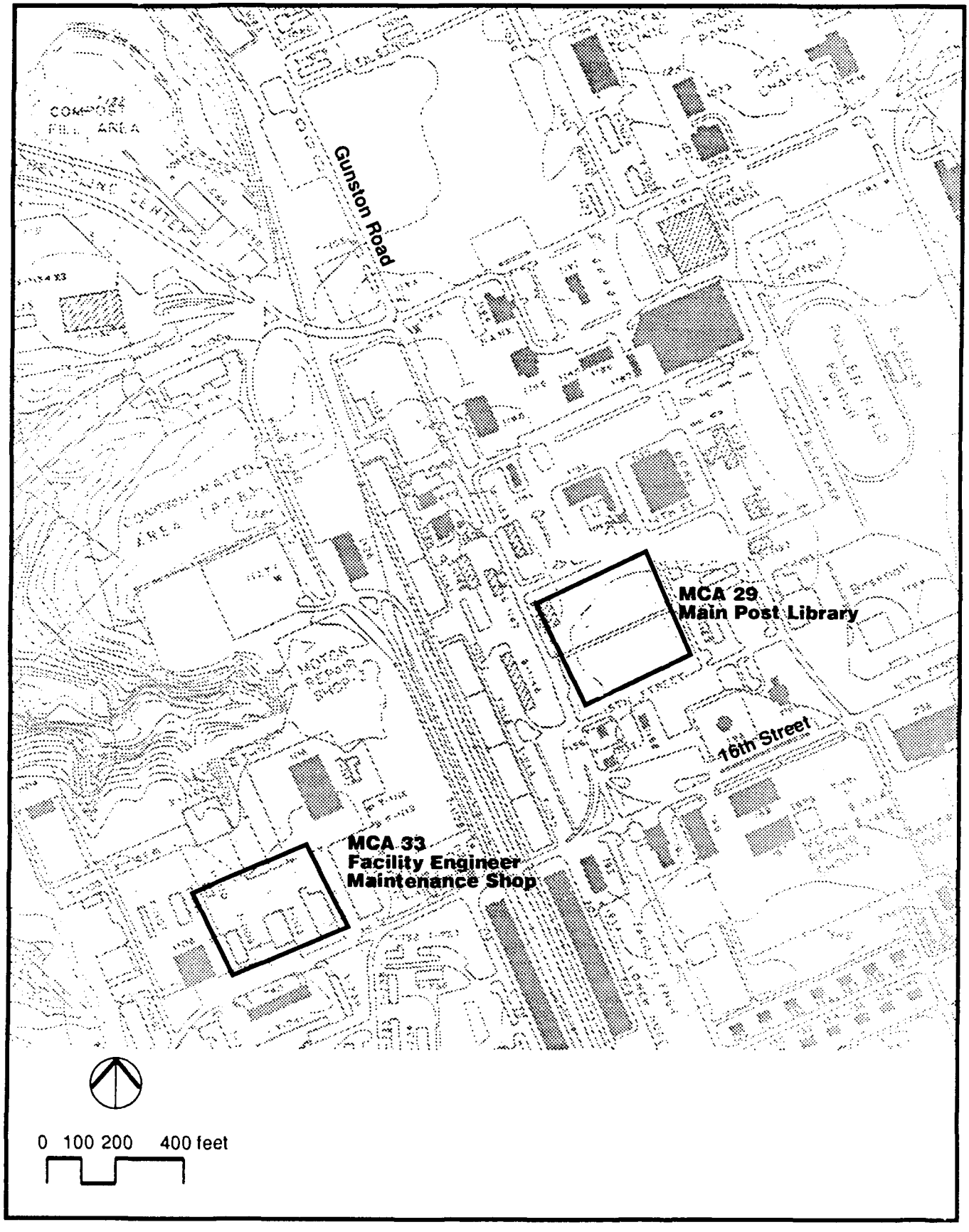


Figure 2-32
Proposed MCA Sites 29 and 33

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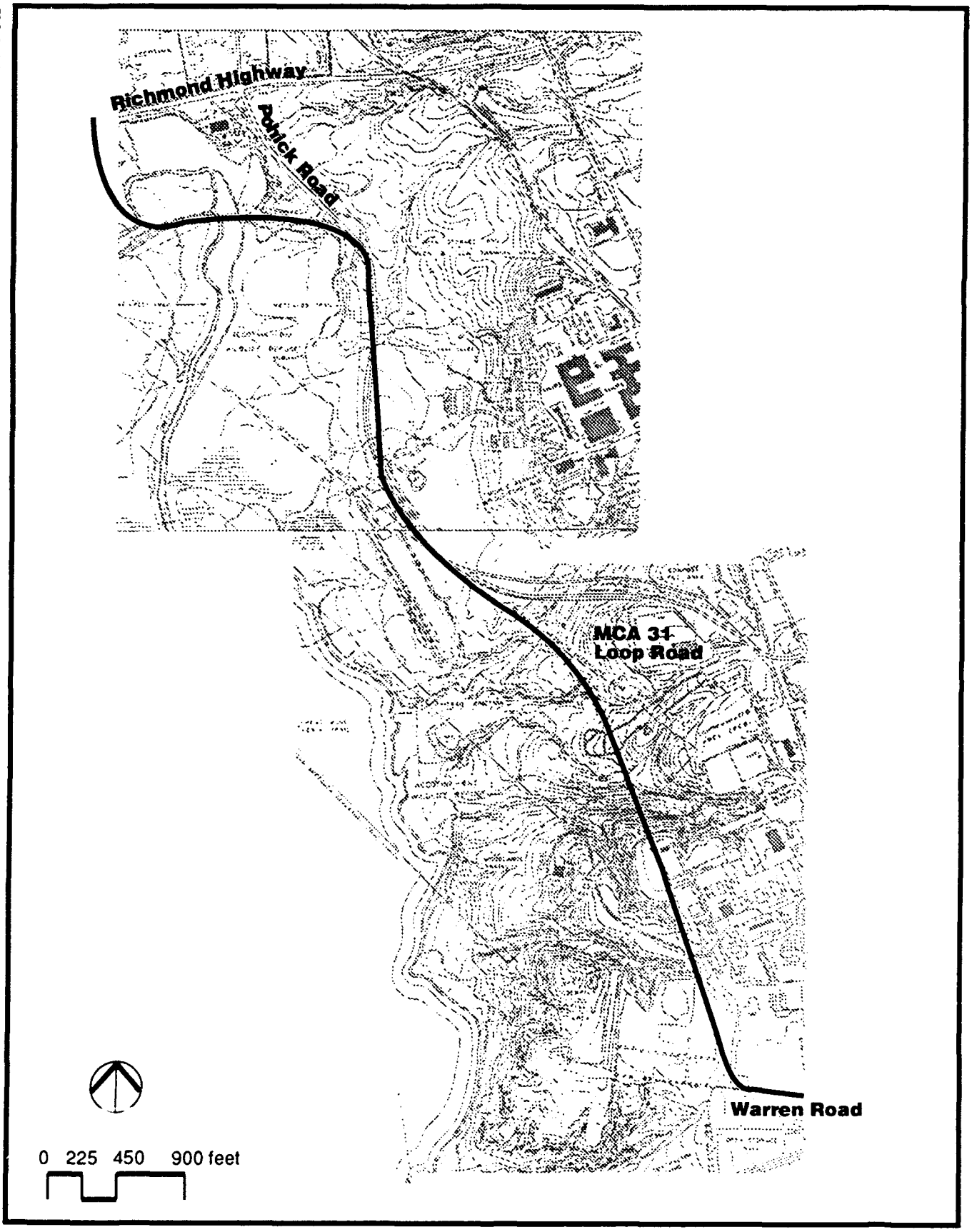


Figure 2-33
Proposed MCA Site 31,
Loop Road

Highway (Figure 2-24). The facility will serve as a welcome and information center for incoming personnel and visitors to Fort Belvoir. This project is programmed, but not yet funded. No environmental documentation has been completed for this project. Appropriate documentation will be completed before construction begins.

2.6.2.33 Facility Engineer Maintenance Shop (MCA 33). The Facility Engineer Maintenance Shop is currently planned for the South Post, west of Gunston Road and north of 16th Street (Figure 2-32). The facility will contain approximately 76,000 square feet of space for a combined shop facility, supply storehouse, lumber shed, and equipment maintenance shop within a fenced, paved compound. The new facility will replace existing substandard WWII structures currently housing these activities. This project is programmed, but not yet funded. No environmental documentation has been completed for this project. Appropriate documentation will be completed before construction begins.

2.6.2.34 Warehouses (MCA 34). Replacement warehouses are planned for west of Gunston Road, north of 16th Street (Figure 2-34). These structures are required for general storage at Fort Belvoir. The new facility will replace existing substandard WWII structures currently used for general storage. This project is programmed, but not yet funded. No environmental documentation has been completed for this project. Appropriate documentation will be completed before construction begins.

2.6.2.35 Tactical Energy Systems Laboratory (MCA 35). The Tactical Energy Systems Laboratory is currently planned for the South Post near the Gunston Cove shoreline, west of the Camouflage Laboratory (Figure 2-29). The facility will have approximately 66,000 square feet of space for a research and development laboratory. The facility will consolidate existing activities into one area and improve working conditions with upgraded and modernized equipment. An environmental assessment has been completed for this facility. This project is budgeted, but not yet funded. An environmental assessment titled *Proposed Tactical Energy Systems Laboratory, Fort Belvoir, Virginia* was completed for this project in November 1985.

2.6.2.36 Conforming Storage Building (MCA 36). The Defense Reutilization and Marketing Office (DRMO) expansion is planned for the North Post at the existing facility location (Figure 2-35). The expansion will contain approximately 115,000 square feet of general storage space; 5,600 square feet of administration space; 20,000 square feet of conforming storage space; 3,600 square yards of scrap bins; 57,000 square yards of paved surface for parking; roads, sidewalks, and outside storage; and 2,400 square yards of gravel surface for parking and outside storage. This project is budgeted, but not yet funded. The environmental assessment for this project is currently in progress.

2.6.2.37 Military Police Station (MCA 37). The Military Police Station is planned for the South Post west of Gunston Road, between 1st and 4th Streets (Figure 2-35). The facility will provide approximately 26,000 square feet of space for operations and administration; classrooms; interview, briefing, detention, and mechanical rooms; public lobby; and a secure hardstand. This new facility will consolidate existing operations, which are in five buildings, into one facility as well as upgrade and modernize facilities.

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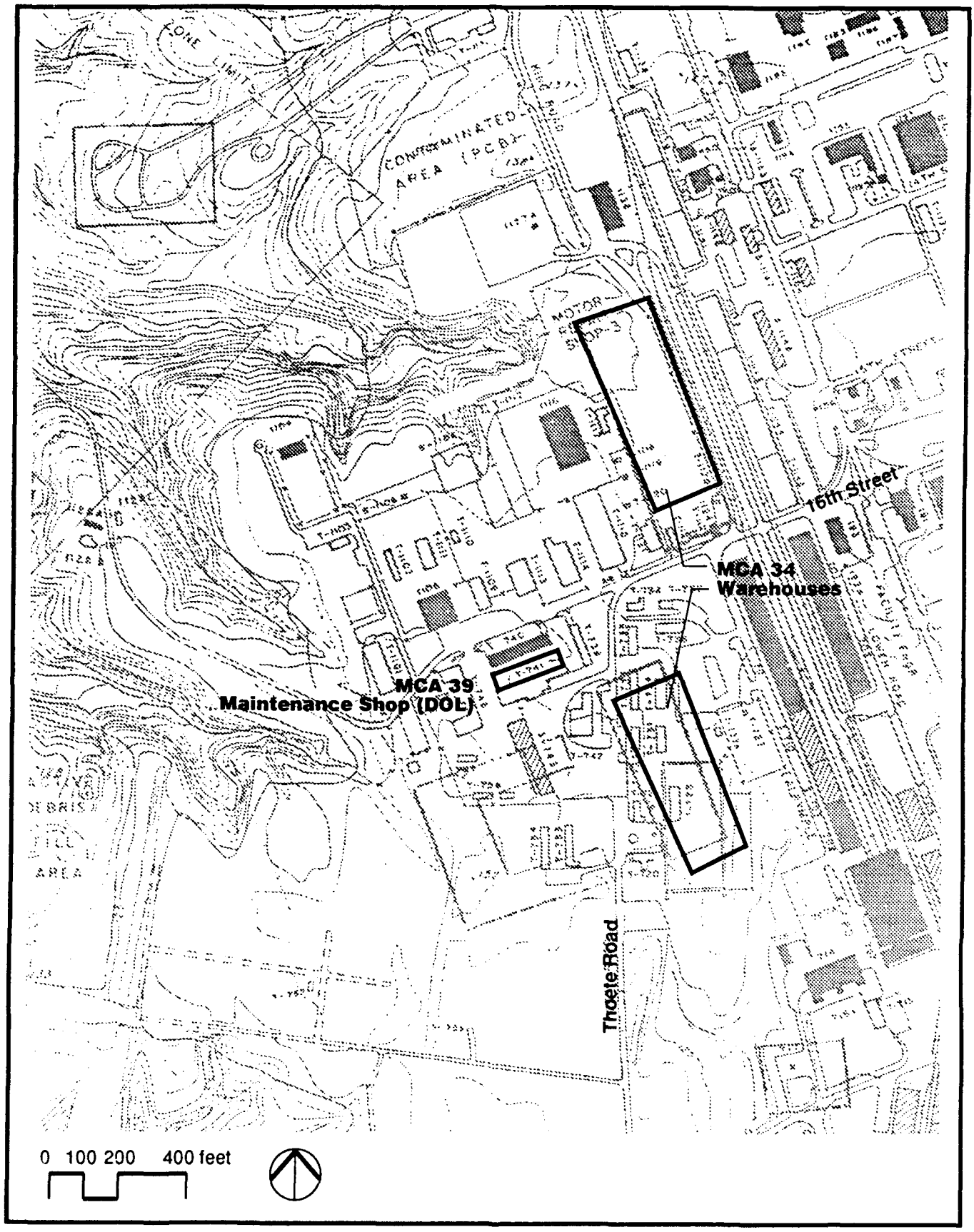


Figure 2-34
Proposed MCA Sites 34 and 39

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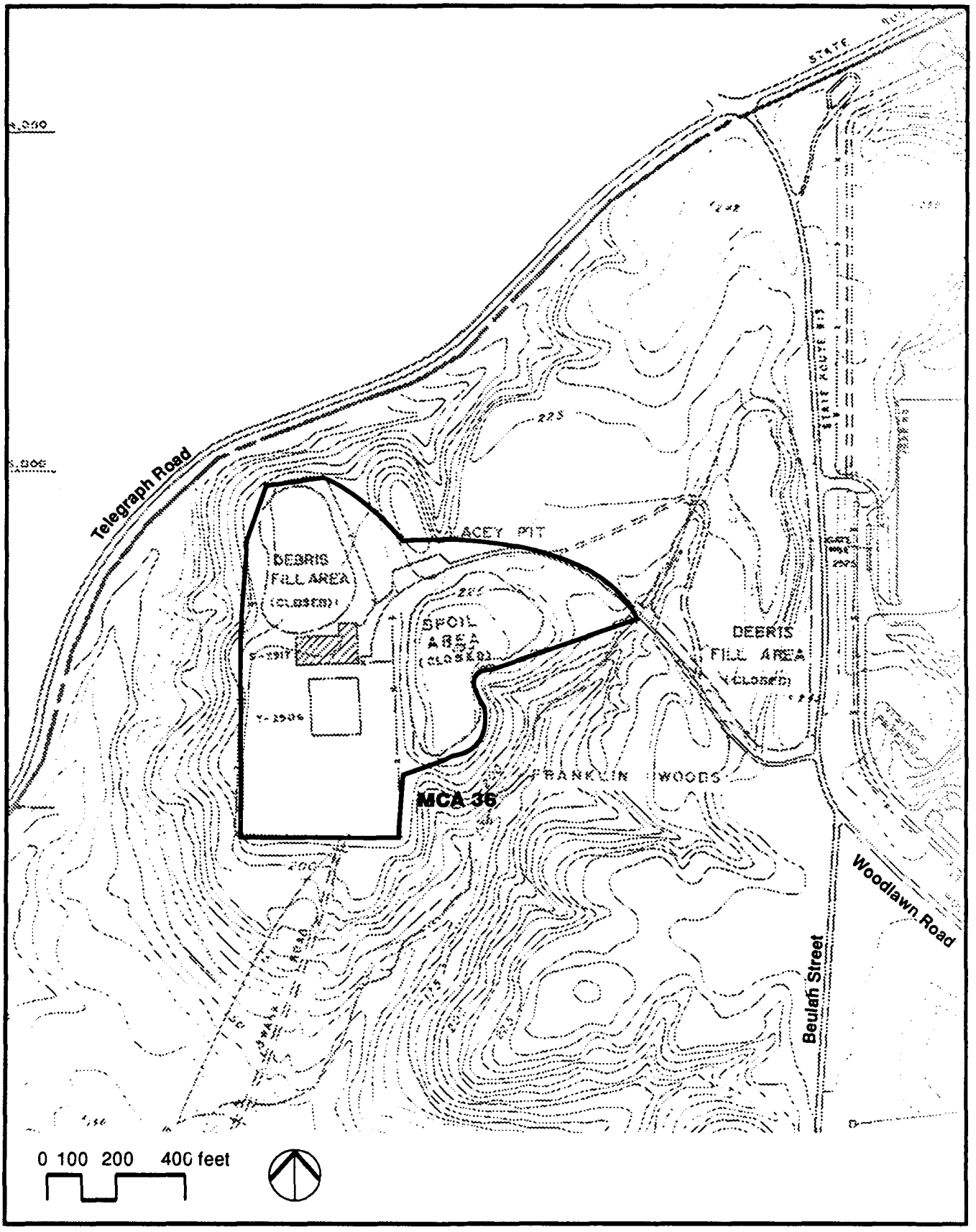


Figure 2-35
Proposed MCA Site 36

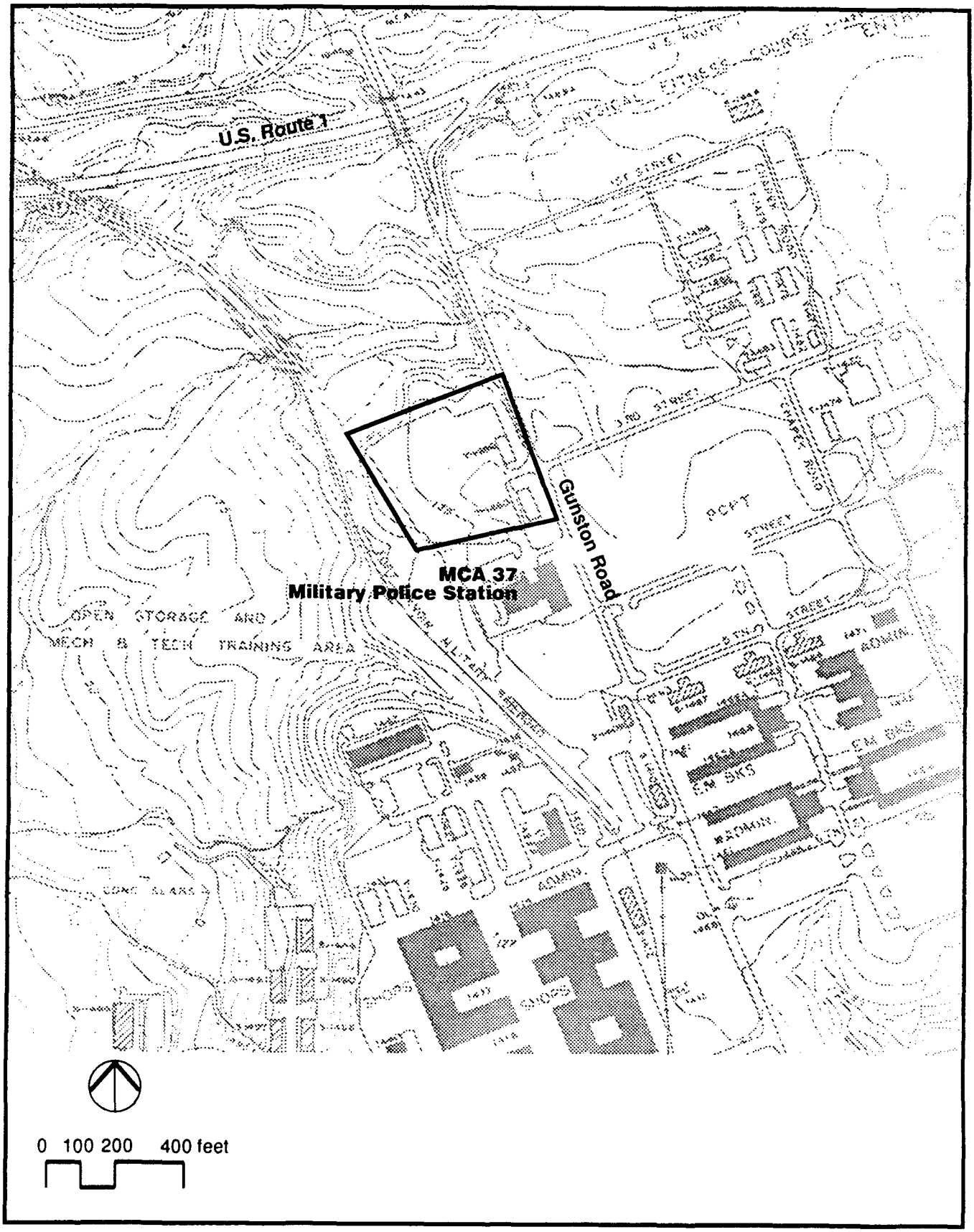


Figure 2-36
Proposed MCA Site 37

This project has not been programmed, funded, or approved to date. No environmental documentation has been completed for this project. Appropriate documentation will be completed before construction begins.

2.6.2.38 Reserve Center/OMA (80th Division) (MCA 38 N and 38 S). The Army Reserve Center (80th Division), is currently planned for two sites. The North Post facility, located between Goethals and Abbott Roads, would be approximately 76,500 square feet and house a maximum of approximately 1,000 reservists, with an average weekend complement of 500 (Figure 2-28). The South Post facility would be located at the existing Motor Repair Shop, north of Johnston Road (Figure 2-37). It would provide ground- and marine-area maintenance support from a 6-bay maintenance facility for wheeled vehicles and a 2-bay maintenance facility for the 15 landing craft to be stationed at the facility. A dock would also be required for the landing craft. A separate environmental assessment is being prepared for this project. This project is programmed, but not yet funded. A categorical exclusion is being prepared for the North Post facility. An environmental assessment is being prepared for the South Post facility.

2.6.2.39 Consolidated Maintenance Shop (MCA 39). A consolidated maintenance shop (DOL) is planned for the South Post west of Lowen Road and north of Warren Road (Figure 2-34). This project has not been budgeted, funded, or approved to date. No environmental documentation has been completed for this project. Appropriate documentation will be completed before construction begins.

2.6.2.40 Electro-Optics Laboratory (MCA 40). The Electro-Optics Laboratory is planned for the South Post east of Wilson Road, south of the Night Vision Laboratory (Figure 2-29). The facility will contain approximately 87,500 square feet of space for highly secured, ultra-specialized laboratory facilities. Construction of the facility will centralize existing activities, which are currently housed in two buildings and have a critical lack of space. This project is programmed, but not yet funded. No environmental documentation has been completed for this project. Appropriate documentation will be completed before construction begins.

2.6.2.41 Fatigue Test Facility (MCA 41). The Fatigue Test Facility is scheduled to have unspecified structural repair work completed. The facility is located on the South Post near the Ponton Basin (Figure 2-19). This project is programmed, but not yet funded. No environmental documentation has been completed for this project. Appropriate documentation will be completed before construction begins.

2.6.2.42 500-Person Administrative Facility (MCA 42). A 500-person administrative facility is outlined in the CDP for the HEC, which is contiguous to Fort Belvoir (Figure 2-38). This facility is still in the early planning stages and has not been programmed, funded, or approved to date. Appropriate documentation will be completed for this project before construction begins.

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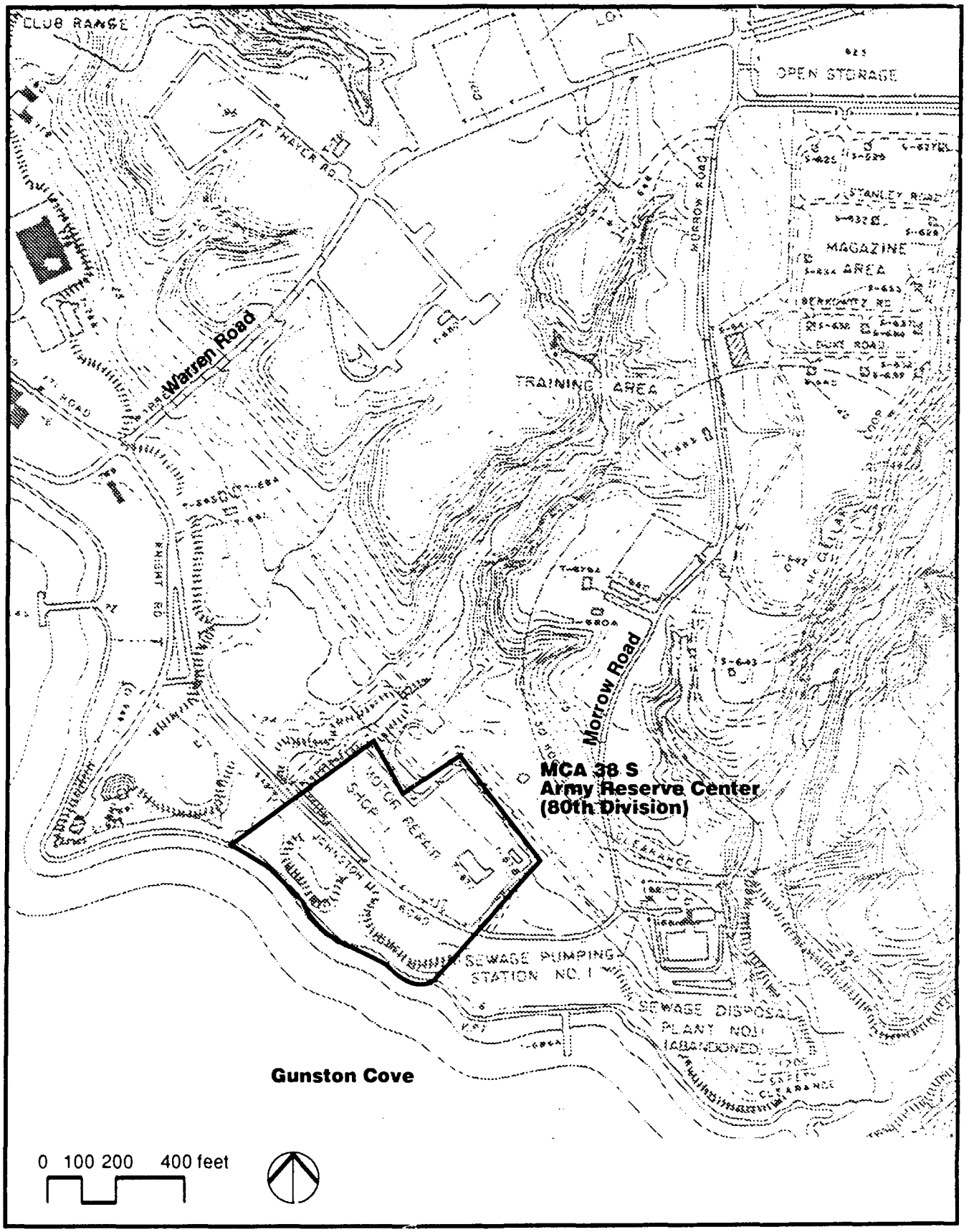


Figure 2-37
Proposed MCA Site 38 S

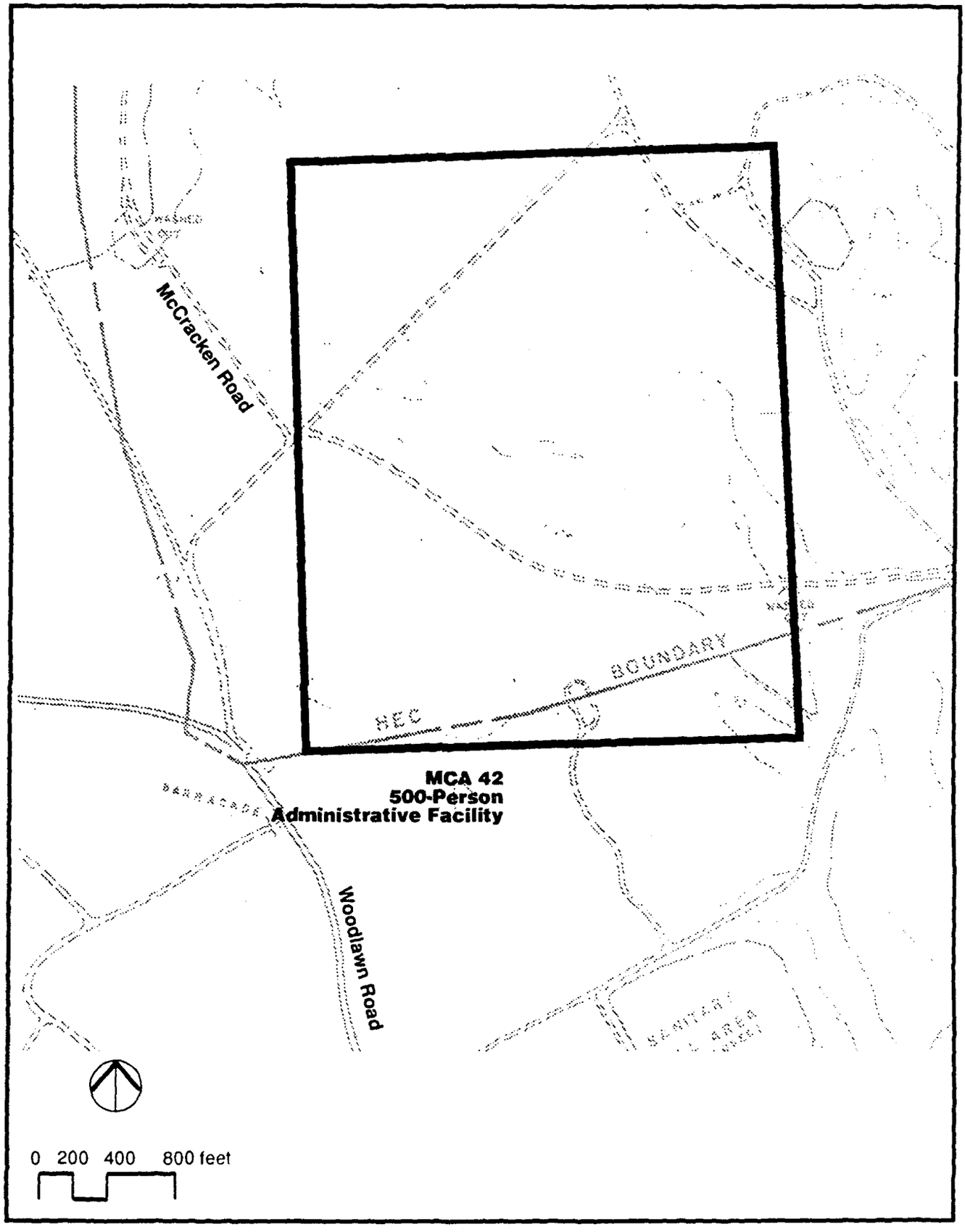


Figure 2-38
Proposed MCA Site 42

2.6.3 ARMY FAMILY HOUSING

A series of whole-house renewals, to include electrical, plumbing, and HVAC upgrades, are planned for the existing on-post housing areas at Fort Belvoir. These actions (AFH 1, 2, and 4 through 14) involve structural and cosmetic repairs and upgrades. The process is scheduled in phases and should be completed in fiscal year 1997. Figures 2-39 through 2-48 show the locations of AFHs 2 through 14. AFH 1 is not illustrated because the renovations are in progress. Except for AFH 1, these renewals have been programmed, but have not been funded to date. Required environmental documentation will be completed for these renovations before they are initiated.

AFH 3 (1,500 new army family housing units) is planned for a large area on the North Post (Figure 2-40). This project is in the early design phases and current housing options include townhouse units, apartments, duplexes, or a combination of these. This project has been authorized, but not programmed or funded to date. Project authorization is for acquisition of 300 units a fiscal year commencing in fiscal year 1992 and continuing until fiscal year 1997. Appropriate environmental documentation will be completed for this project before construction begins.

2.6.4 NONAPPROPRIATED FUNDS

2.6.4.1 Youth Center (NAF 1). The Youth Center is planned for the South Post, south of Hurley Road on Langfitt Loop (Figure 2-49). Construction will require the removal of seven existing structures and their sidewalk and parking areas. The Youth Center will provide 20,522 square feet of space for dependent youth activities. This project has been funded, but is not yet under construction. Appropriate environmental documentation will be prepared before construction begins.

2.6.4.2 Tompkins Basin Armed Forces Recreation Area (NAF 2). A recreation area in the Tompkins Basin is planned for the South Post at the confluence of Accotink Bay and Gunston Cove (Figure 2-50). This area will have a beach area, nature center, equipment issue center, travel campground cabins, family and group picnic areas, multi-play courts, administration offices, marina with wet and dry boat storage, restaurant, active play areas, swimming pool and a maintenance facility. It will provide recreational facilities for military personnel and their families in the metropolitan Washington region. A separate environmental assessment is being prepared for this project. This project has been funded, but is not yet under construction.

2.6.4.3 Horse Stables (NAF 3). Additional stables will be sited in the vicinity of the Old Guard Horse Stables (MCA 10). Figure 2-23 shows the general area of the site. This structure will be a separate facility for horses belonging to on-post military personnel and their families. The stable facility will share the pasture facilities of the Old Guard Horse Stables. This project has not been approved, programmed, or funded to date. Appropriate environmental documentation will be completed for this project before construction begins.

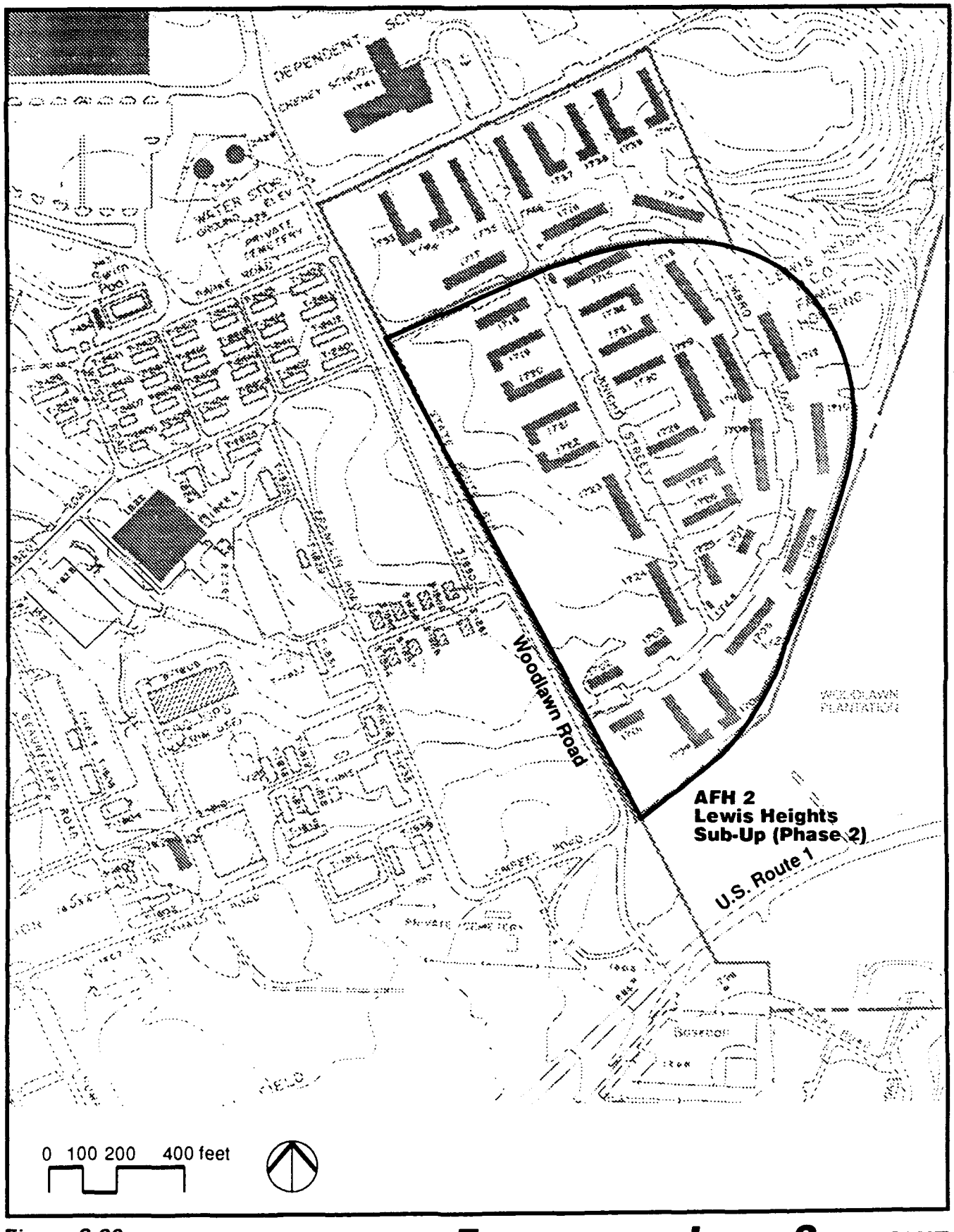


Figure 2-39
Proposed AFH Site 2

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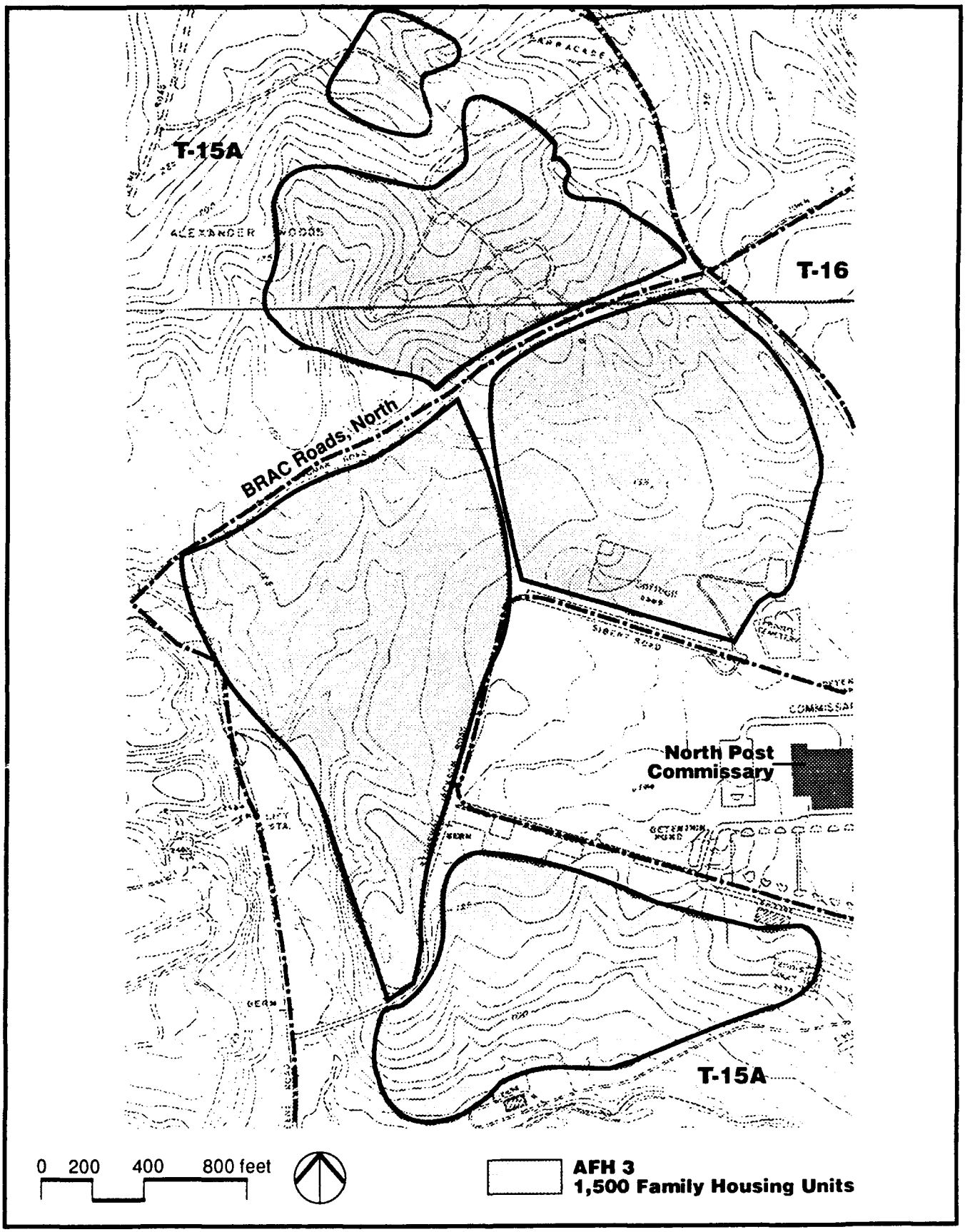


Figure 2-40
Proposed AFH Site 3,
Family Housing Units

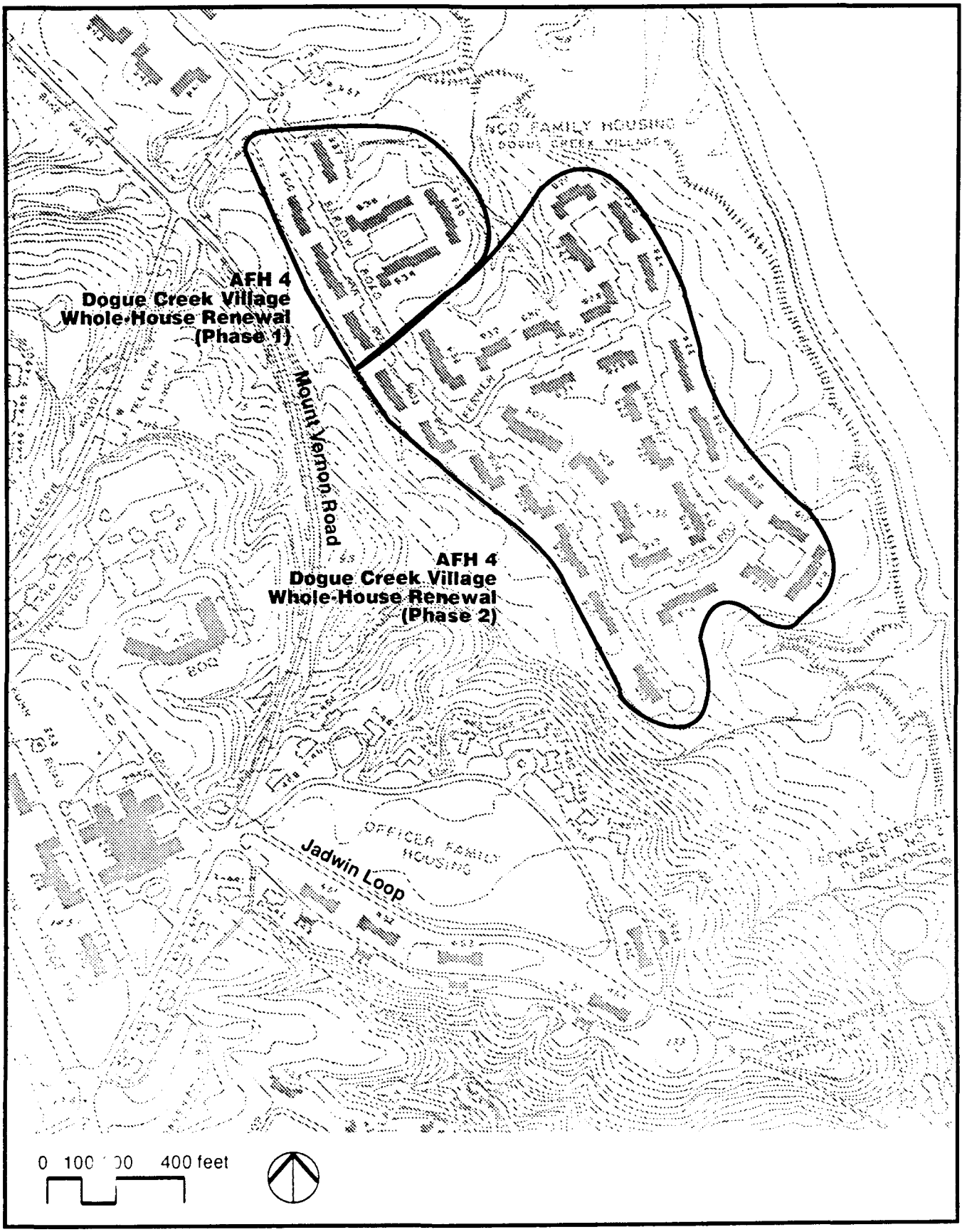


Figure 2-41
Proposed AFH Site 4

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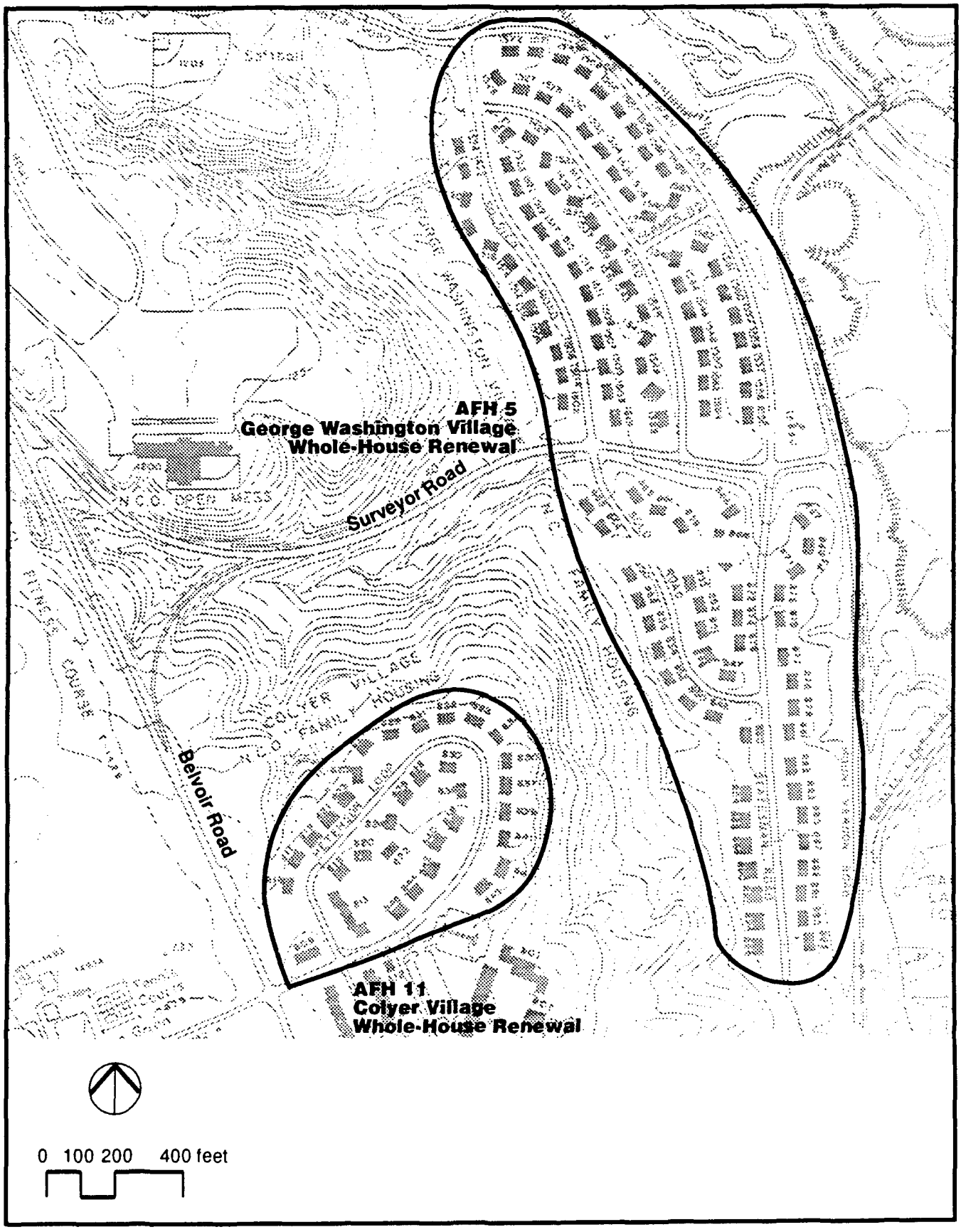


Figure 2-42
Proposed AFH Sites 5 and 11

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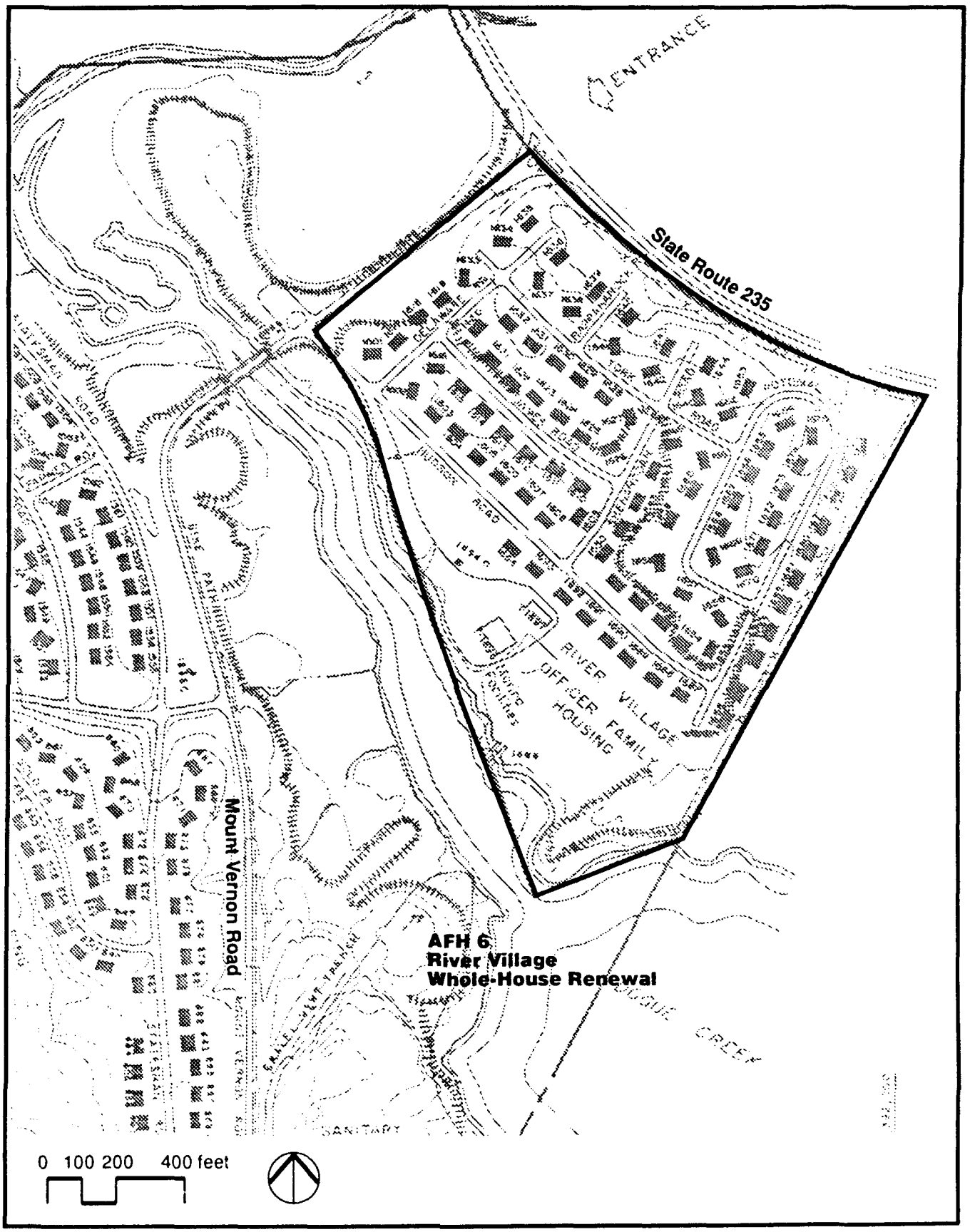


Figure 2-43
Proposed AFH Site 6

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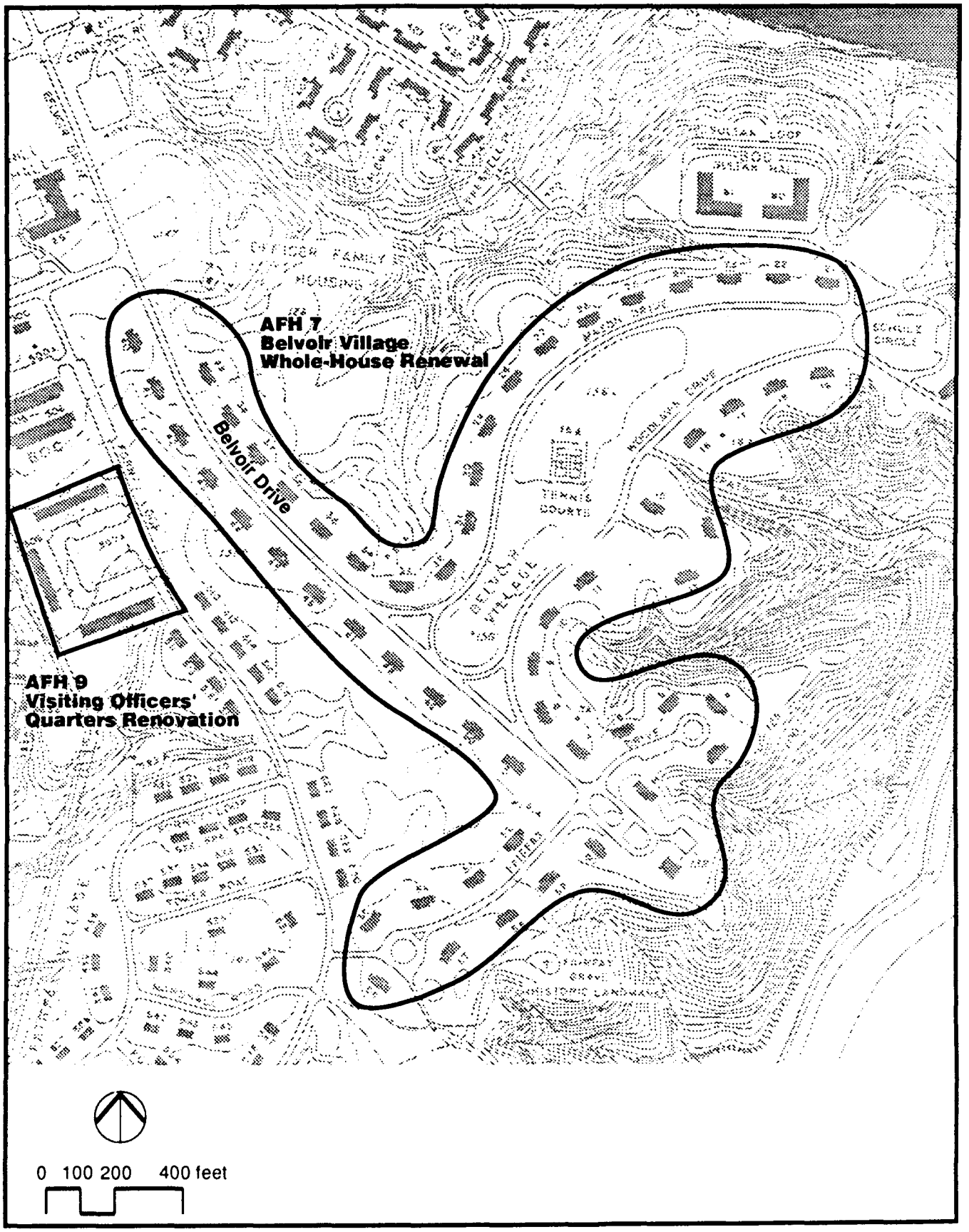


Figure 2-44
Proposed AFH Sites 7 and 9

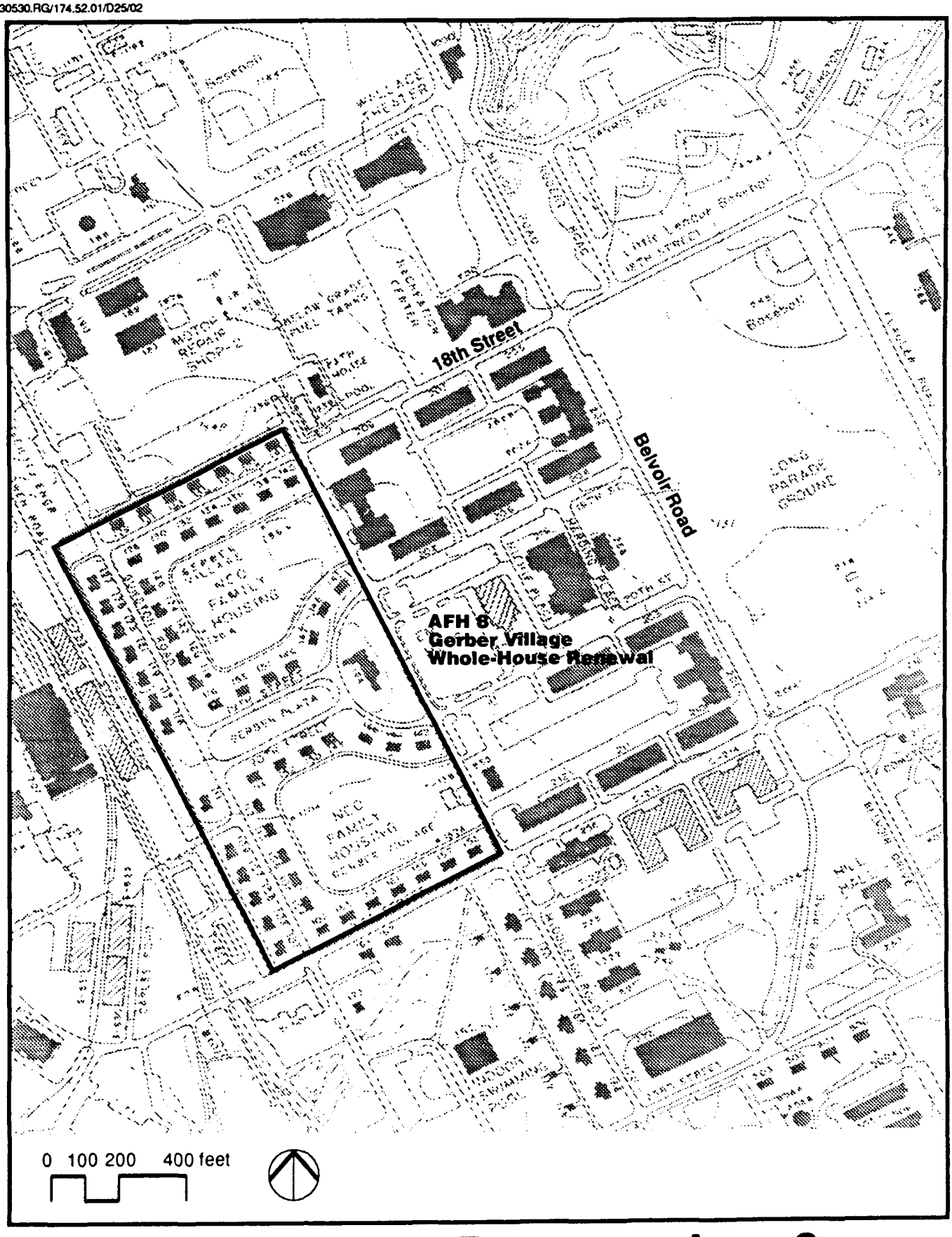


Figure 2-45
Proposed AFH Site 8

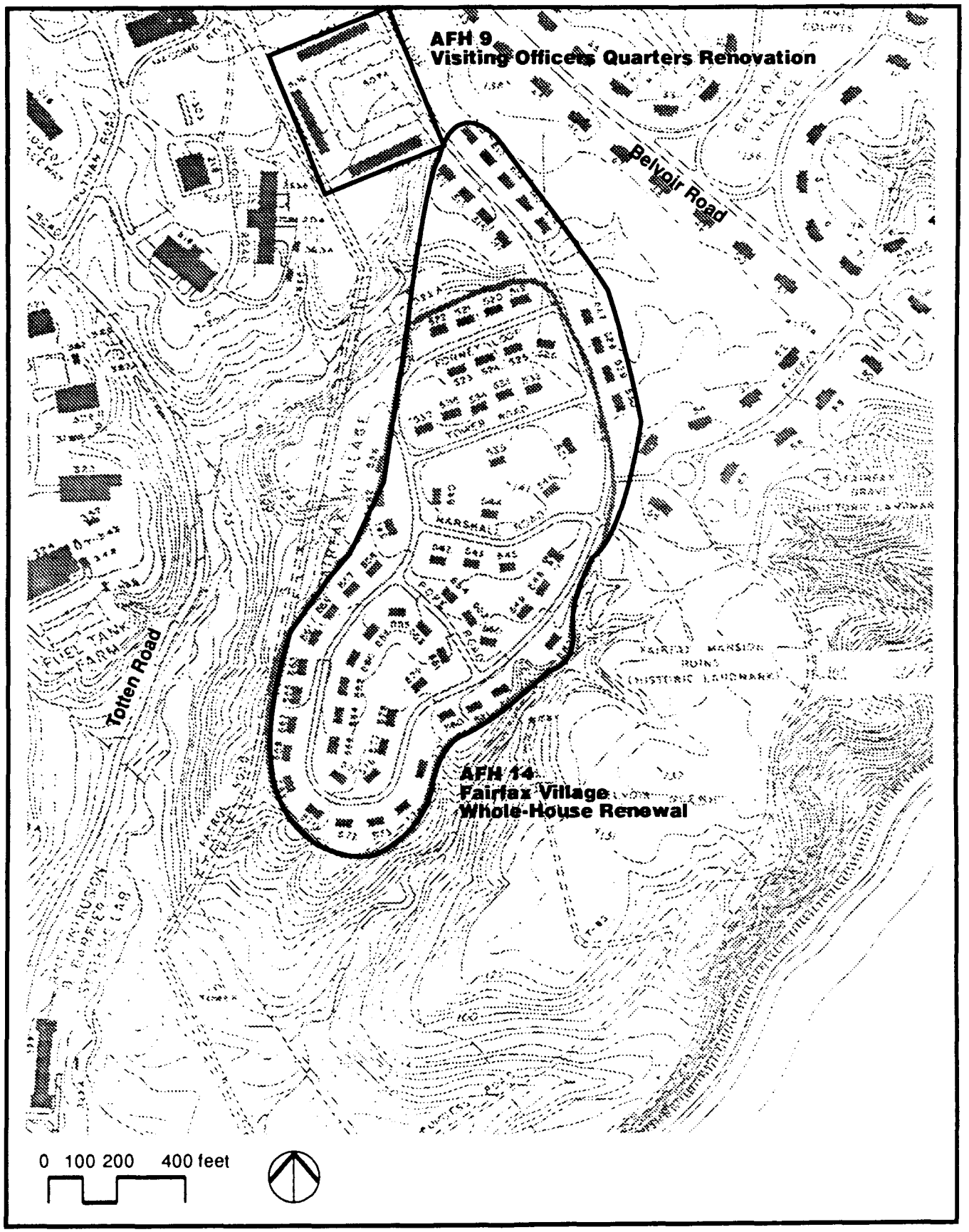


Figure 2-46
Proposed AFH Sites 9 and 14

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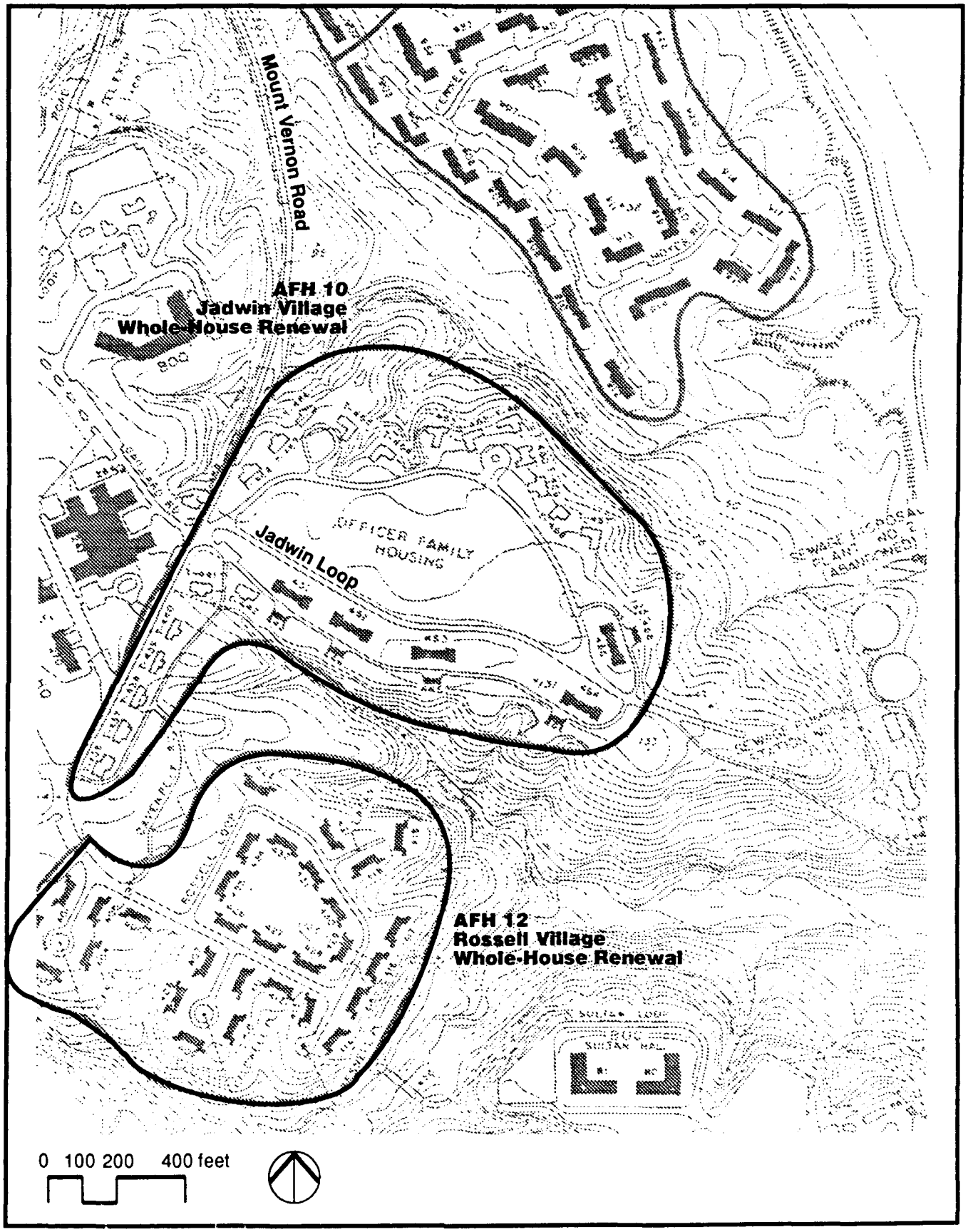


Figure 2-47
Proposed AFH Sites 10 and 12

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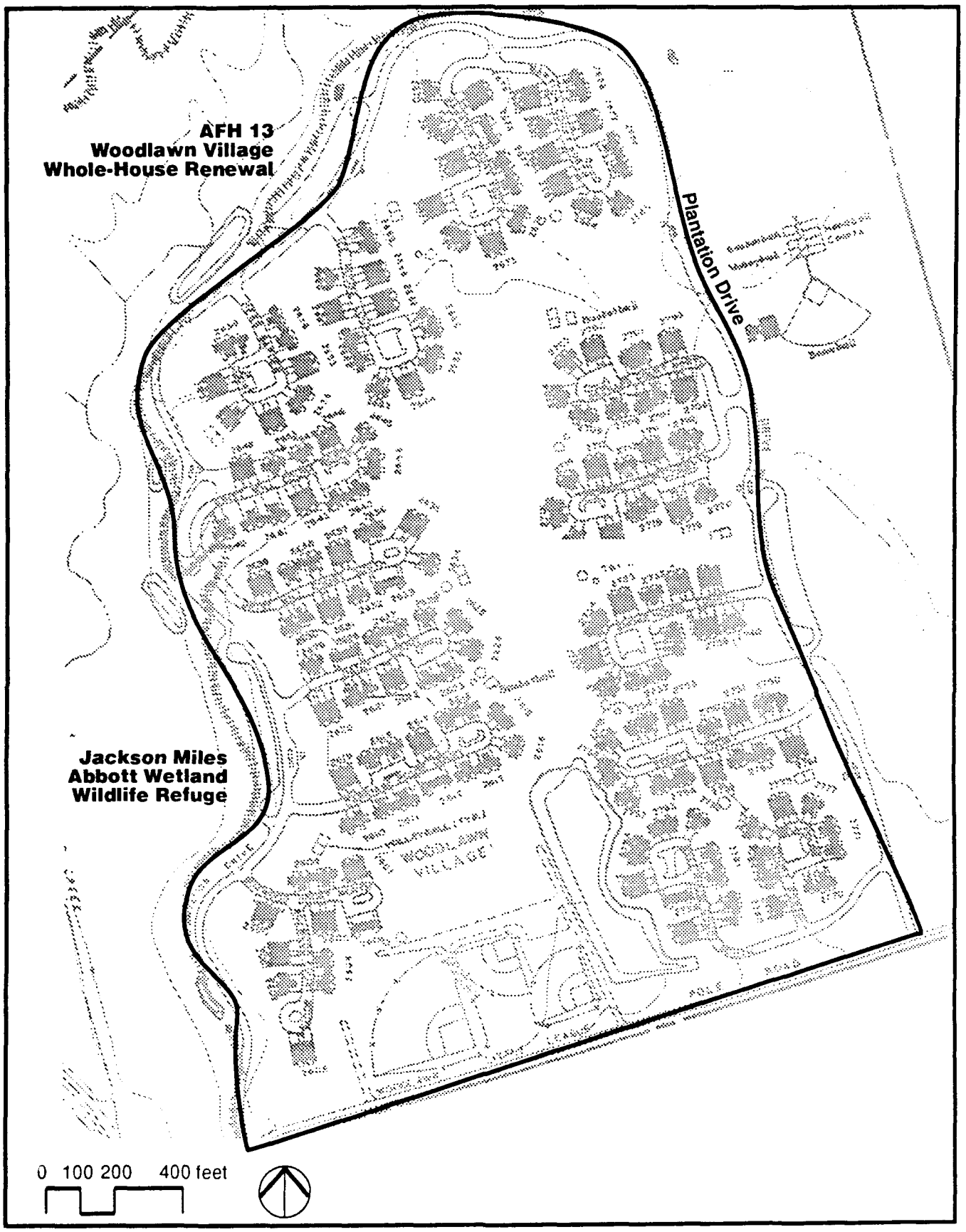


Figure 2-48
Proposed AFH Site 13

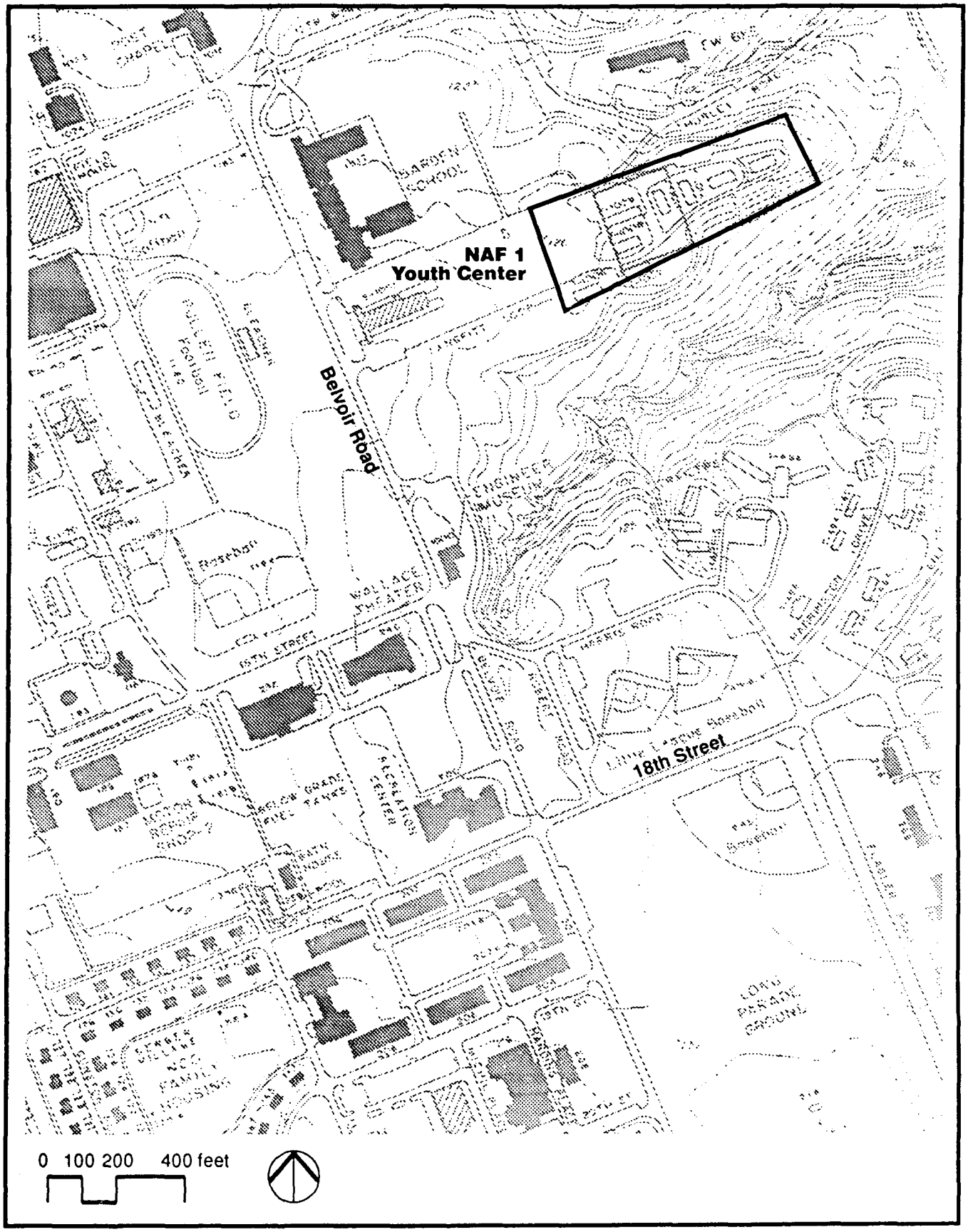


Figure 2-49
Proposed NAF Site 1

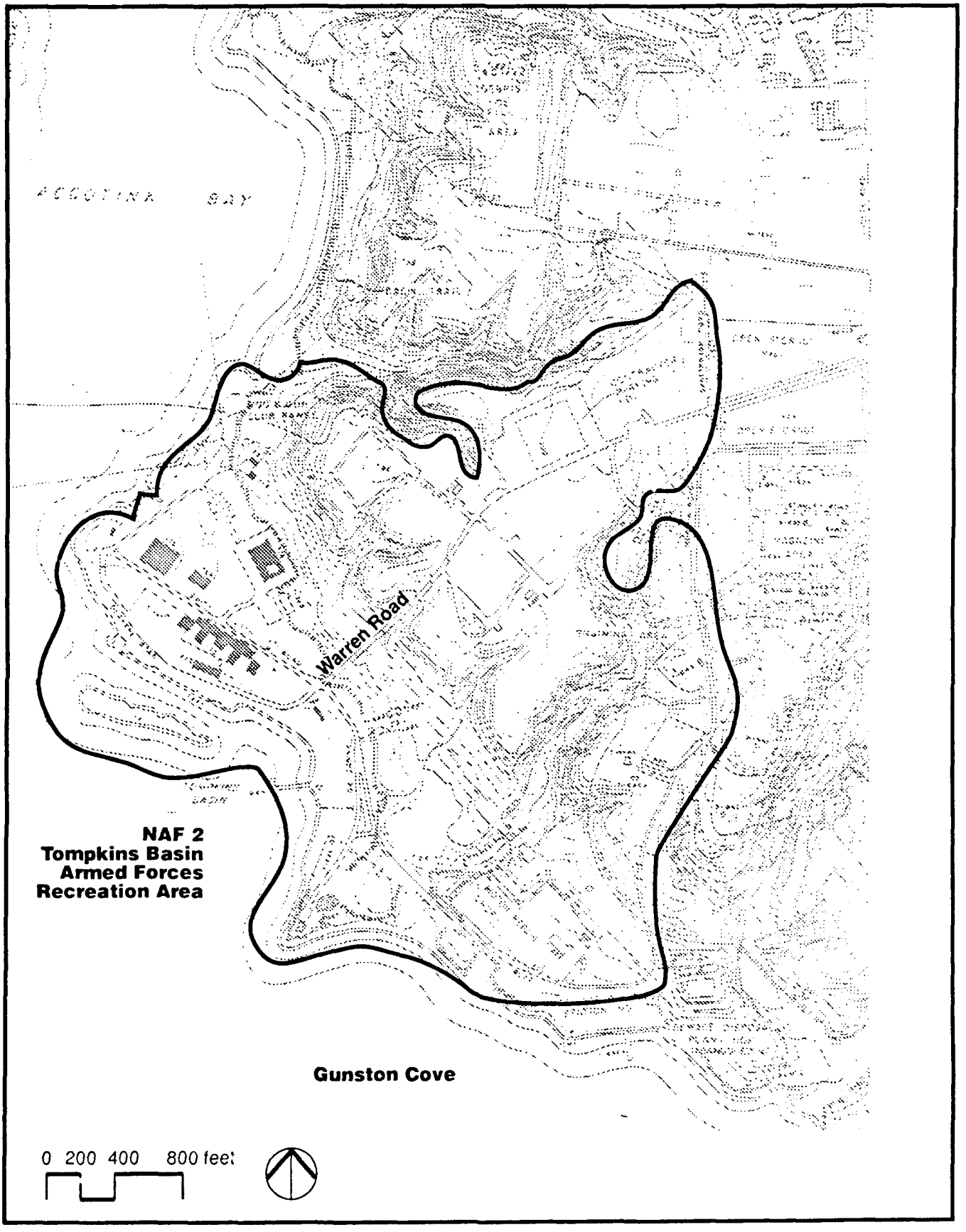


Figure 2-50
Proposed NAF Site 2

2.6.4.4 Benyuard Pool Addition (NAF 4). The Benyuard Pool addition is planned in order to increase the size of the existing facility located on the South Post between 21st and 23rd Streets, west of Middleton Road (Figure 2-51). The expansion is needed to accommodate the increase in post population as a result of growth. This project has been programmed, but not yet funded. Appropriate environmental documentation will be completed for this project before construction begins.

2.6.4.5 Golf Course (NAF 5). A new golf course is planned for a site immediately adjacent to and southwest of the existing North Eighteen Golf Course (Figure 2-52). The new golf course will be a regulation 18-hole course with all required ancillary facilities, including cart paths, a club house, cart storage building, cart maintenance facility, supply storage building, and automatic sprinkler system. This project has been programmed, but not yet funded. Appropriate environmental documentation will be completed for this project before construction begins.

2.6.4.6 Corporate Fitness Center (NAF 6). The Corporate Fitness Center is planned for the South Post east of Chapek Road, south of 1st Street, and northwest of the 6th green of the South Nine Golf Course (Figure 2-53). The facility will provide physical fitness facilities for off-post military personnel and civilian employees. This project has been programmed, but not yet funded. Appropriate environmental documentation will be completed for this project before construction begins.

2.6.4.7 Child Development Center (NAF 7). Another child development center is planned as an addition to the Headquarters Complex (BRAC 1) on the North Post. The facility will provide onsite child care for employees of the Headquarters Complex. Figure 2-3 shows the general area of the site. This project has been funded, but is not yet under construction. Appropriate environmental documentation will be completed for this project before construction begins.

2.6.4.8 Temporary Lodging Facility (NAF 8). A temporary lodging facility is planned for the South Post east of Pence gate, north of Taylor Road (Figure 2-53). The structure will house personnel transferred to the area who have not yet been quartered at permanent facilities. This project has been funded, but is not yet under construction. Appropriate environmental documentation will be completed for this project before construction begins.

2.6.5 ARMY AND AIR FORCE EXCHANGE SERVICES

2.6.5.1 AAFES 1. A Burger King™ is planned for the South Post in the main shopping area, north of 12th Street and east of Gunston Road (Figure 2-54). Appropriate environmental documentation will be completed for this project before construction begins.

2.6.5.2 AAFES 2. A second fast-food chicken restaurant is planned for the North Post, south of AFH 3. This restaurant is included in the North Post Shopping Center. Appropriate environmental documentation will be completed for this project before construction begins.

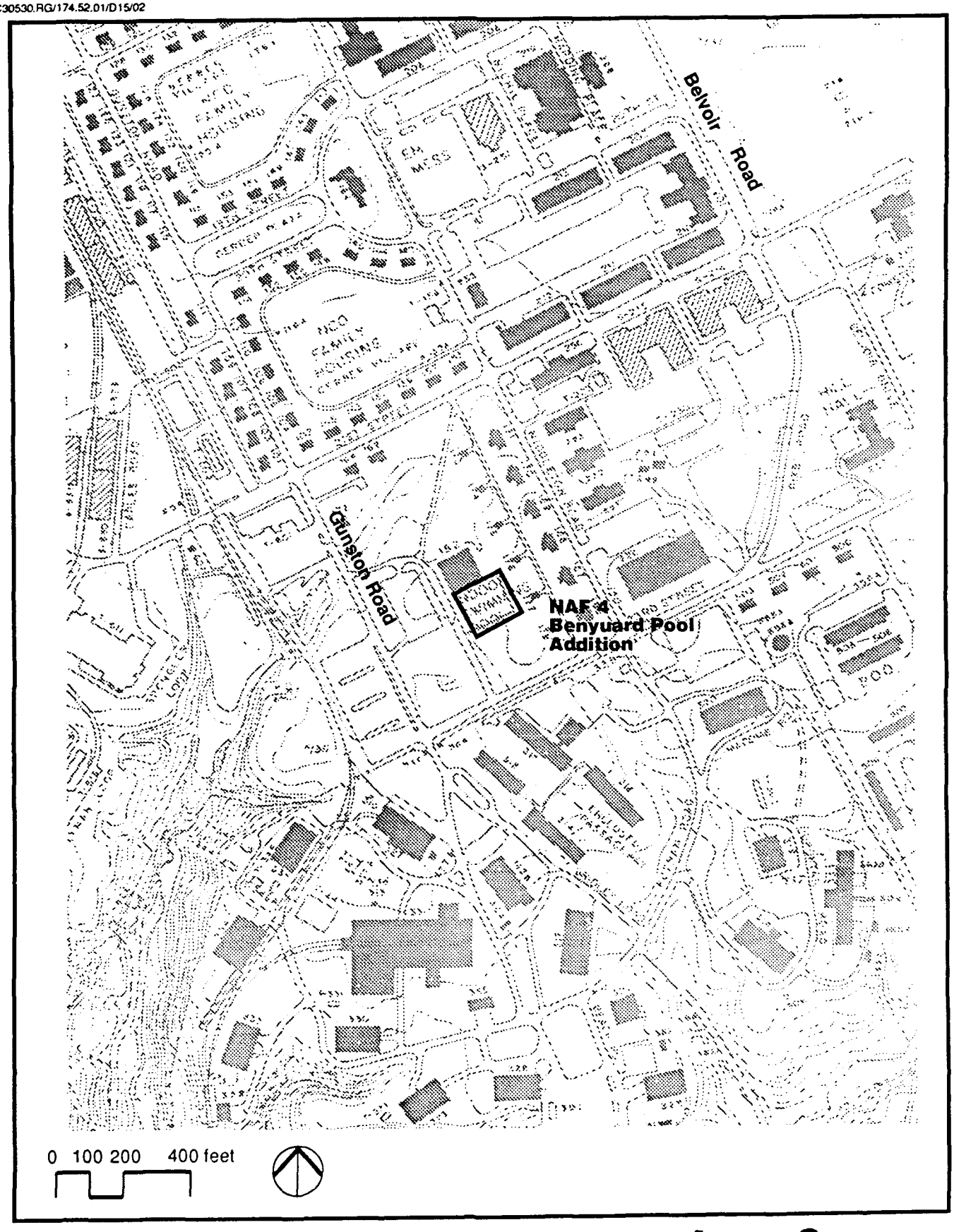


Figure 2-51
Proposed NAF Site 4

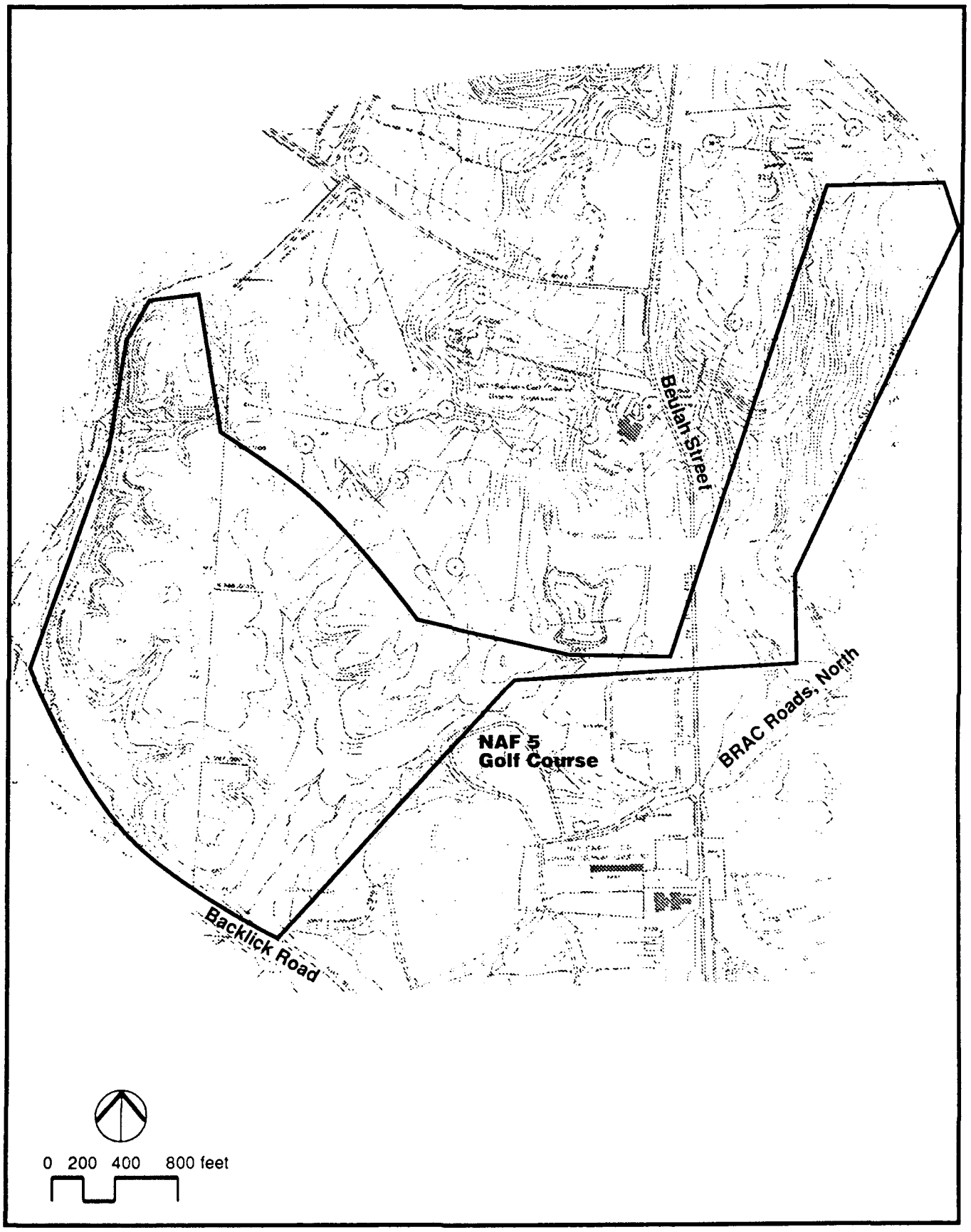


Figure 2-52
Proposed NAF Site 5

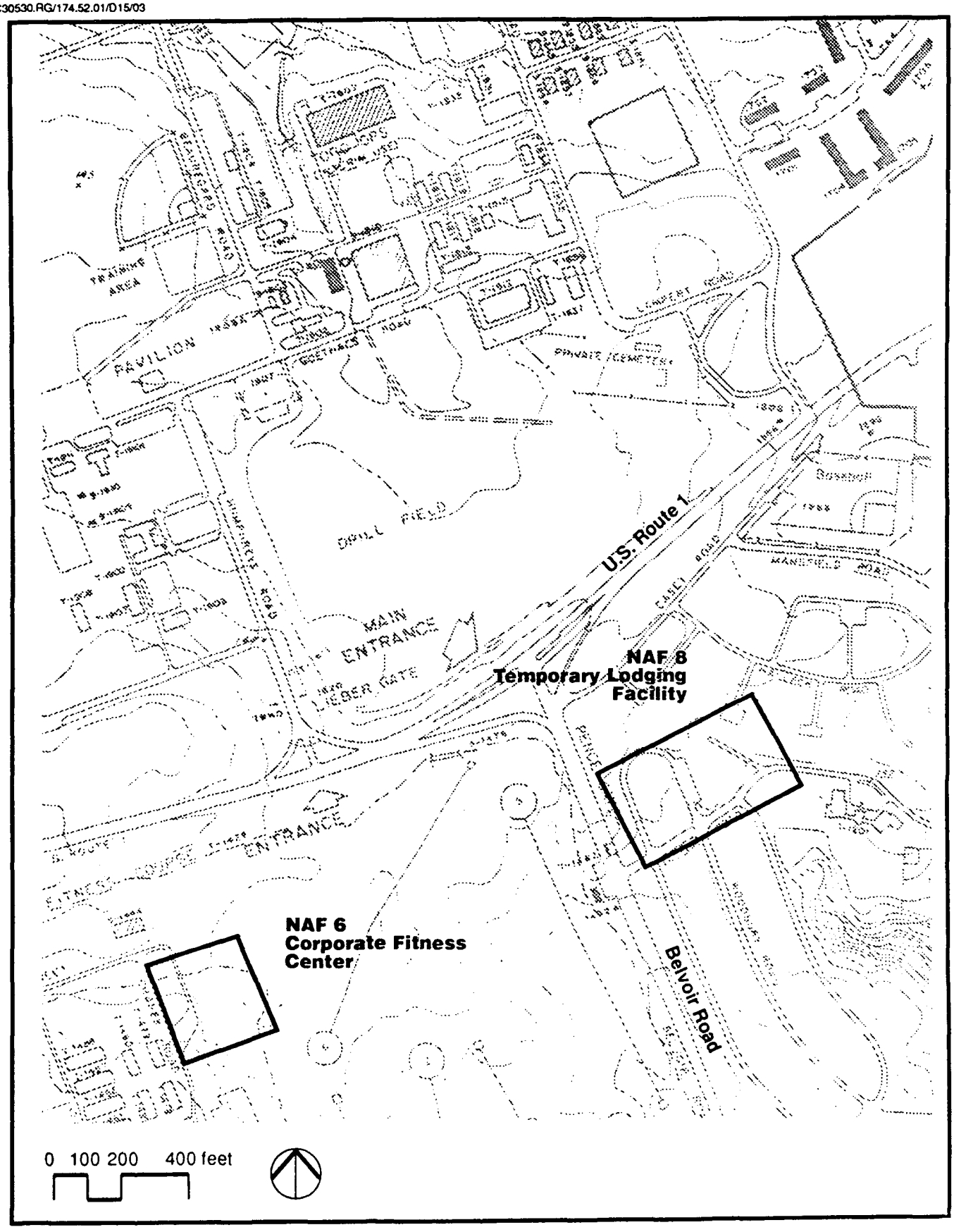


Figure 2-53
Proposed NAF Sites 6 and 8

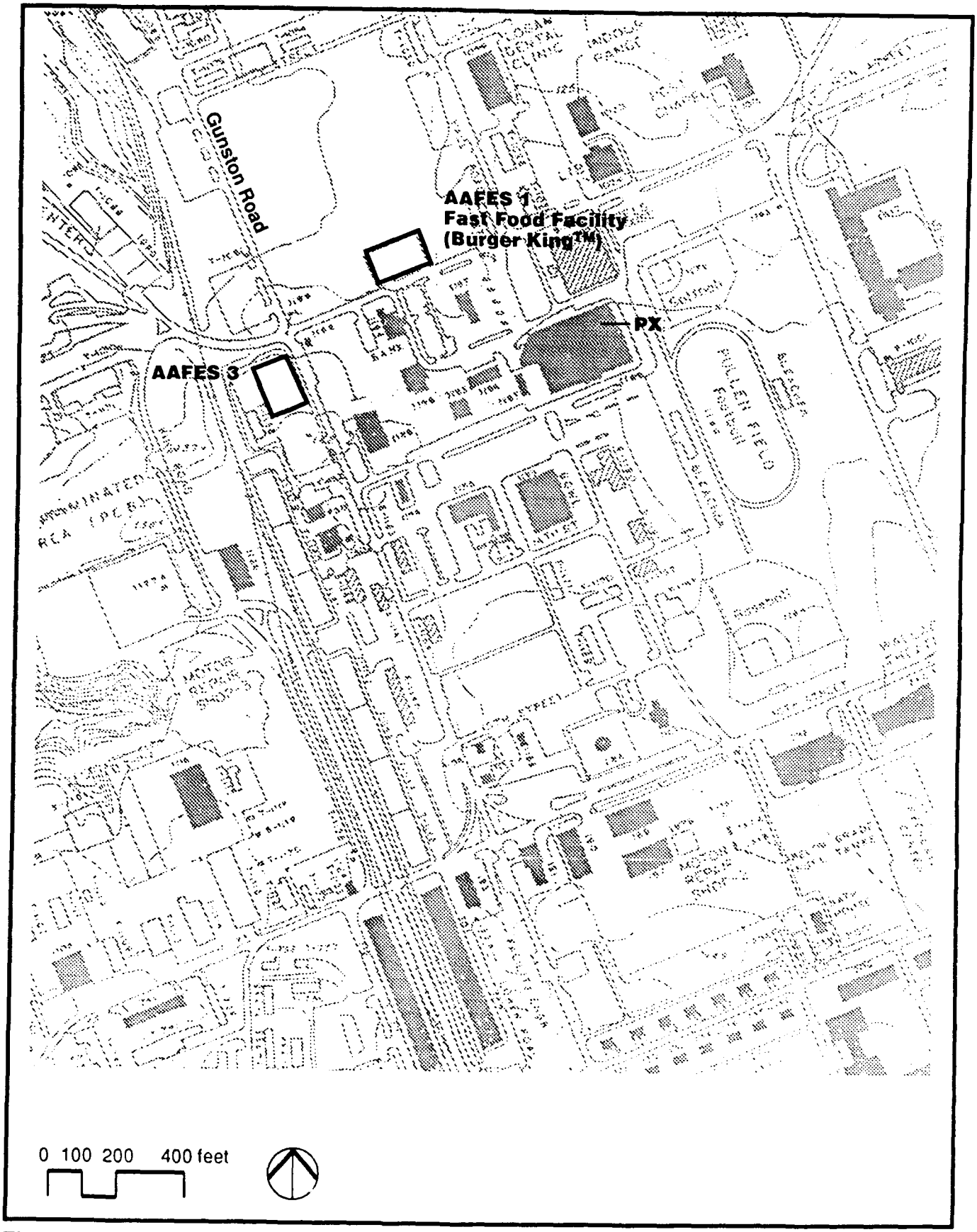


Figure 2-54
Proposed AAFES Sites 1 and 3

2.6.5.3 AAFES 3. A car-care facility is planned for the South Post, west of Gunston Road (Figure 2-54). Appropriate environmental documentation will be completed for this project before construction begins.

2.6.6 LEASED SPACE

In addition to the personnel consolidations described in Section 2.4.4.1, other consolidations are planned for relocating additional activities, currently in leased space within the NCR, to Fort Belvoir. These personnel consolidations are, however, not part of P.L. 100-526, and separate NEPA documentation will be prepared for these actions. These additional consolidations are not part of this EIS, but are included for informational purposes only.

2.7 ALTERNATIVES TO THE CONCEPT DEVELOPMENT PLAN

2.7.1 ALTERNATIVE SITES

Potential sites have been identified by Fort Belvoir planners for the many projects proposed at Fort Belvoir. The alternatives for these CDP projects include changes in final siting, as well as the timing of the projects' initiation. An evaluation of environmental constraints will be used to determine the actual locations of the "footprints" for proposed projects. To date, the CDP has shown the approximate locations for these projects. The location within a site and the actual site may change. However, new sites will be considered only if they are also consistent with the goals and objectives of the Fort Belvoir Master Plan. Additional NEPA documentation will be prepared for these actions if appropriate when the projects are closer to actual implementation.

2.7.2 NO-ACTION ALTERNATIVE

The No-Action Alternative for the Concept Development Plan projects at Fort Belvoir would result in insufficient support activities for the current mission, as well as inadequate functional space. Additional environmental impact analyses will be prepared for these actions, if appropriate, when the projects are closer to actual implementation. That documentation will provide specific discussions of alternatives, including the No-Action Alternative for each individual project.

2.8 DISPOSAL AND ALTERNATIVE FUTURE USES OF CAMERON STATION

The statutory requirements of P.L. 100-526 are that all realignments and closures be completed by September 30, 1995. Proceeds from the sale of Cameron Station must go into the Base Closure Account and will be used to provide new facilities and to fund other relocation costs associated with P.L. 100-526. However, the proceeds from the sale will not provide up-front money for the new construction because the proceeds

from the sale of the property will not become available until after the construction is completed and Cameron Station is vacated. Because of the statutory time limit, construction needs to be started as early as mid-1991 so the new facilities at Fort Belvoir can be completed for the personnel being realigned.

P.L. 100-526 transfers the responsibility for disposing of all property under the Federal Property and Administrative Services Act of 1949 and the Surplus Property Act of 1944 from the Administrator of the General Services Administration to the Secretary of Defense. Under this authority the property is to be disposed of in a certain sequence. The disposal sequence for Cameron Station is the following:

1. Offer facility to DOD agencies for use.

2. Offer facility under Section 501 of the McKinney Act (P.L. 100-77), excluding property taken by DOD agencies, to sponsoring organizations for the homeless.

3. Offer facility, excluding property set aside during the preceding steps, to other federal agencies.

4. Offer facility, excluding property set aside during the preceding steps, to state and local government agencies.

5. Property not disposed of through the above process is then offered through competitive bid to the private sector.

Studies have been initiated to define the extent of environmental contamination at Cameron Station. These studies will help in developing sufficient information to adequately assess the health and environmental risks associated with closure, determine the necessity for remedial action, and develop and evaluate remedial alternatives for decisions to be made regarding preparation of the property for release. Subsequent remediation, if determined to be necessary, would be coordinated with and conducted in compliance with federal, state, and local standards and regulations to remove any health and environmental threats.

A highest and best use study has been prepared for Cameron Station (Delta Research Corp., 1989). Cameron Station could be developed for a full range of commercial office, retail, residential, and industrial uses. However, the actual reuse will depend on the plans of the property developer and their conformance with Alexandria's zoning regulations. The City of Alexandria has invested a considerable amount of time focusing on the issue of rezoning the property from the I-1, Industrial designation to Coordinated Development District. The Reuse Task Force has also been convened to evaluate potential development alternatives.

The highest and best use study suggested a moderately intense mixed-use development, predominantly residential in character with a limited amount of commercial office and supporting retail activity (Delta Research Corp., 1989). The Army, the City of Alexandria, and the Reuse Task Force have all developed recommendations for reuse. A scenario for 1,800 dwelling units, 640,000 gross square feet of commercial space, and

120,000 gross square feet of retail space is possible, and this scenario was used for modeling purposes. However, the City Council has zoned 50 acres of the property for open space; 70 acres for residential development, with a maximum of 1,910 units; 16 acres for commercial development; and 28 acres for infrastructure. The amount of office and retail space within the commercial zone will be dependent on whether or not an Eisenhower Avenue connector is constructed. The City Council has approved the construction of 400,000 square feet of office space and 80,000 square feet of retail space if the connector is built. If the connector is not built, the commercial office space will be limited to 300,000 square feet.

WDCR510/008.51

Chapter 3.0
DESCRIPTION OF THE EXISTING ENVIRONMENT

3.1 CAMERON STATION

Cameron Station is an approximately 164-acre Army installation located in the City of Alexandria, Virginia, approximately 1.8 miles west of downtown Alexandria and one mile east of the Interstate 395 and Duke Street (Route 236) interchange in Fairfax County. Mixed commercial and industrial developments border Cameron Station along its western and northwestern sections. Duke Street borders the installation to the northeast. Holmes Run and Backlick Run delineate Cameron Station's eastern and southern boundaries, respectively. These two streams converge at the southeastern corner of the installation to form Cameron Run, a tributary of the Potomac River. A Southern Railway right-of-way parallels Backlick Run and separates Cameron Station from Cameron Run Valley West, an industrial area located south of the installation.

The installation's primary mission is to provide support to the Commanding General of the MDW. The principal operations at Cameron Station include administration, commissary, and PX support for MDW. Thirty-three buildings, parking for 4,000 vehicles, and Cameron Lake are the dominant features of the installation, which is a "closed" post, i.e., all entrance and exit gates are manned by either military or DOD civilian police to control access to the post.

3.1.1 PHYSICAL/CHEMICAL RESOURCES

3.1.1.1 Physiography and Topography

Elevations at Cameron Station range from about 50 to 70 feet above mean low water (U.S. Geological Survey, 1984). Changes in topography at Cameron Station are gradual; the highest elevations occur in the northwestern portion of the site, and the lowest elevations are found in the southeast corner, near Cameron Lake. A U.S. Army Toxic and Hazardous Materials Agency (USATHAMA) report (1984) stated that historically the property was filled with "a wide variety of materials," the depth of fill ranging from 3.5 feet in the northwest area of the post to 5.5 feet in the southeast. Cameron Station was originally swamp land (USATHAMA, 1989).

Extensive earth-moving activities on the site have resulted in roads that are about three feet below original grade (McLain, personal communication). As a consequence of this grading and of the construction of stormwater drainage structures, approximately 97 percent of the site is now within the 100-year floodplain, according to a study by U.S. Army Corps of Engineers, Baltimore District (November 1989).

3.1.1.2 Geology and Groundwater

Cameron Station is in the Coastal Plain Province, which comprises poorly consolidated silt, sand, clay, and gravel schist formations, underlain by crystalline rock. This rock is principally early Paleozoic mica at a depth of 30 to 50 feet in the area of Cameron Station. Groundwater depth at Cameron Station is from 10 to 20 feet. The installation uses the municipal water source; groundwater in the area is not used as the water supply (USATHAMA, 1984).

3.1.1.3 Soils

The soils at Cameron Station are sandy silts with local mixtures of clay, which have been locally disturbed and graded and compacted by pedestrian traffic. These soils were formed from deposition of alluvium, gravel, sand, silt, and clay at Holmes and Backlick Runs. The USATHAMA report (1984) states that these soils are easily excavated with power equipment and provide good foundations for roads, paths, and structures.

3.1.1.4 Surface Water

Dominant surface water resources in the Cameron Station area are Backlick Run, Holmes Run, Cameron Run, and Cameron Lake. Backlick Run flows through a concrete flume along the southern border of the site, Holmes Run follows the eastern border of the site, and Cameron Run forms at their confluence near the southeast corner of Cameron Station.

Cameron Lake is located about 100 yards inside the east gate, and covers approximately eight acres. Cameron Lake was originally two ponds (north and south ponds). Natural springs and stormwater runoff reportedly provide water to the lake (USATHAMA, 1989). Depth in Cameron Lake ranges from 0.8 to 6.0 feet, with an average of 3.4 feet depending on drainage activities. According to one report, during 1956-57, portions of the north pond were dredged for fill, and old cables, wire, and drums of oil were dumped into the ponds and covered over; during 1959-60 the ponds were joined during a dredging and cleaning operation creating the lake's current configuration (Cook, 1976).

Stormwater on the site is directed to Backlick Run either directly by drainage systems, or indirectly by drainage to Cameron Lake, which during peak storm events drains into Backlick Run approximately 600 feet upstream from Cameron Run. Cameron Run becomes Hunting Creek, which enters the Potomac River approximately 3.3 miles downstream of Cameron Station.

Little data exists on the water quality of Cameron Lake. A U.S. Fish and Wildlife Fishery management plan for Cameron Lake (undated, circa 1977) notes that the pH of the water was between 7.0 and 9.8, and had a total hardness of 35-65 parts per million (ppm). Frequent plankton blooms in the lake were noted in these early reports; however, the construction of an aeration fountain has apparently remedied

anoxic conditions in the lake. The studies also showed significant amounts of cadmium (30 to 60 micrograms/liter (μg/l)), copper (30 to 40 μg/l), and mercury (0.4 to 0.6 μg/l). These levels of cadmium and copper are above Virginia water quality standards (VR 680-21-00), given the reported hardness of the water.

A U.S. Geological Survey water gauge (number 0165300) is in place on Cameron Run at the Southern Railway bridge, 800 feet downstream of the confluence of Backlick and Holmes Runs. The drainage area of Cameron Run at this gauge is 33.7 square miles (SWCB, 1982). Records of monthly discharge at the Cameron Run gauge date to 1955; the average monthly discharge is 36.2 cubic feet per second over the 35-year period (Prugh et al., 1988).

Water quality data is available for Cameron Run because the Virginia State Water Control Board (SWCB) sampled water at the Cameron Run stream gauge at monthly intervals between 1974 and 1987. At least once during this sampling period, Cameron Run waters violated current state standards for pH, cadmium, copper, lead, zinc, total fecal coliform, toxaphene, heptachlor, and mercury levels (EPA, 1989). A variety of possible sources of heavy metals to Cameron Run exist, because it receives runoff from urbanized and industrial areas in Alexandria and Fairfax County. The Army is conducting further studies to ensure that Cameron Station, including Cameron Lake, meets standards for contaminant levels before disposal of the post occurs.

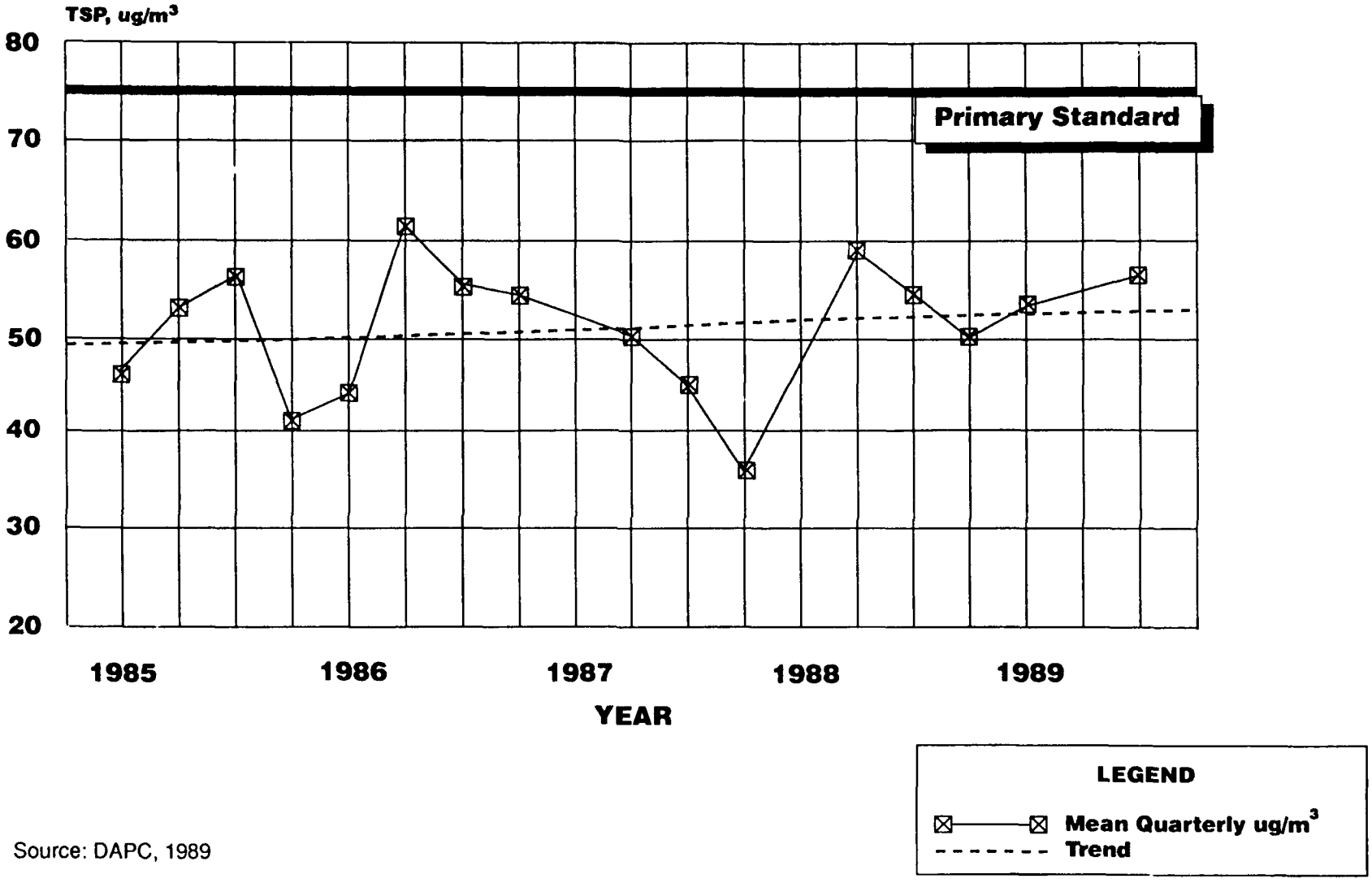
3.1.1.5 Climate and Air Quality

Climate at Cameron Station is similar to that of the Northern Virginia region as a whole, as described in Section 3.2.1.5. A discussion of air quality resources in the City of Alexandria area is given below.

The City of Alexandria Health Department, Environmental Quality Unit, measures air quality parameters that are required by EPA using a high-volume sampler at the Health Department Building within five miles of Cameron Station. In addition, the Environmental Quality Unit monitors total suspended particulates (TSP) at a sampler on top of Building 26 on the post.

Ambient air quality in the City of Alexandria complies with EPA attainment criteria for all air quality parameters (Virginia Department of Air Pollution Control, 1989). However, because the larger National Capital Interstate Air Quality Control Region (AQCR)--Virginia Portion (EPA Region III and the Virginia State Air Pollution Board Region VII) does not meet EPA criteria, the entire air basin is designated as a nonattainment area for carbon monoxide (CO) and ozone. However, the Virginia Department of Air Pollution Control (DAPC) has petitioned EPA not to use the regional concept of CO nonattainment designations, because, unlike ozone, CO emissions have a very short life span in the atmosphere and are generally recognized as localized problems.

Figure 3-1 illustrates the trend in TSP at the Alexandria sampling station near Cameron Station for the past 5 years. TSP has increased slightly during this time (dashed line),



Source: DAPC, 1989

Figure 3-1
Region VII - 5-Year Trend of Total Suspended Particulates (TSP)
Alexandria, Virginia

but this increase is not statistically significant (DAPC, 1989). Maximum TSP measured during 1989 in Alexandria was 106 $\mu g/m^3$, which is below the Virginia Ambient Air Quality Secondary Standard of 150 $\mu g/m^3$.

The maximum level of CO measured in Alexandria over a 1-hour period in 1989 was 14.9 ppm (below the National Ambient Air Quality, "primary" standard of 35 ppm); the maximum level of CO measured over an 8-hour period in 1989 was 7.9 ppm, (below the primary standard of 9 ppm). Over the past 9 years, Alexandria exceeded the 8-hour CO primary standard once in 1982 and three times in 1984; no violations occurred in Alexandria of the 1-hour CO primary standard during that time period.

Sulphur dioxide (SO_2) levels in Alexandria during 1989 were also within the primary standard of 0.50 ppm for a running, non-overlapping, 3-hour average. The maximum SO_2 measured in a 3-hour period in 1989 was 0.099 ppm. Likewise, the maximum level of nitrogen dioxide in Alexandria (0.031 ppm, reported as the arithmetic mean of 1-hour observations) did not exceed the primary standard of 0.05 ppm during 1989.

No violations of the primary ozone standard (hourly values of 0.12 ppm) were measured in 1989 in Alexandria. However, the following violations of the primary ozone standard did occur in Alexandria over the past 8 years: one violation in 1982, five violations in 1983, one violation in 1987, and four violations in 1988. There was minimal detection of lead and cadmium in Alexandria during 1989.

Air emissions from Cameron Station come from power boilers of the central heating units, the on-post incinerator, and from vehicular sources (USATHAMA, 1989).

3.1.2 BIOLOGICAL RESOURCES

3.1.2.1 Terrestrial Biota

Vegetative cover at Cameron Station is sparse, consisting primarily of lawns and ornamental plantings around the buildings. The area around Cameron Lake is planted with weeping willows (*Salix babylonica*). Remaining native vegetation in the vicinity of the lake includes several oak species (*Quercus* spp.), sweet gum (*Liquidambar styraciflua*), tulip poplar (*Liriodendron tulipifera*), flowering dogwood (*Cornus florida*), flowering cherry (*Prunus mahaleb* var. *Kwanzan*), and red maple (*Acer rubrum*).

Little habitat exists for wildlife at Cameron Station, except for Cameron Lake, which attracts large numbers of mallards, domestic ducks, Canada geese, laughing gulls, and pigeons; three swans currently use Cameron Lake, and two peacocks live in a large cage near the west side of the lake. Because of the post's position in the Atlantic flyway, many other species of birds (ducks, geese, shorebirds, and passerines) may be sighted at Cameron Station intermittently during migration.

3.1.2.2 Wetlands

Cameron Station was once swamp land, possibly vegetated with the palustrine hardwoods and the wetlands shrub species indigenous to Backlick Run and Holmes Run. However, filling, stormwater control structures, and stream channels have eliminated wetland habitat from the post. Filling occurred at least as long ago as the first half of the twentieth century, before the Clean Water Act or any other protective wetland legislation was enacted. Earth-moving activities associated with construction needs may have occurred as recently as the early 1980s (McLain, personal communication).

3.1.2.3 Aquatic Biota

Management of Cameron Lake as a game fisheries resource has been established by a "tripartite agreement" among MDW, the Virginia State Commission of Game and Inland Fisheries, and the U.S. Fish & Wildlife Service. Through this arrangement, a Fisheries Management Plan was established for Cameron Lake by the U.S. Fish and Wildlife Service (1977). This plan recommended a number of activities and fishing practices aimed at maintaining a population of inland game fish, especially largemouth bass (*Micropterus salmoides*).

The U.S. Fish & Wildlife Service reported in 1977 that Cameron Lake was overcrowded with undersized bluegill (*Lepomis macrochirus*) and golden shiners (*Notemigonus crysoleucas*) because the water was shallow. Other fish species collected in 50-foot seine nets at that time were channel catfish (*Ictalurus punctatus*) and black crappie (*Pomoxis nigromaculatus*). Cameron Lake experiences no problems with excessive growth of submerged or emergent aquatic vegetation, because of the grazing by waterfowl. As discussed in Section 3.1.1.4, the aeration fountain has apparently alleviated plankton blooms that were caused by high nutrient levels associated with waterfowl in the lake.

3.1.2.4 Threatened and Endangered Species

A BATES has been prepared for the areas evaluated in this EIS (Appendix B). The resource agencies contacted indicated no threatened or endangered species have been reported at Cameron Station. No state or federal endangered species were located during a site visit conducted in March 1990, nor was any suitable habitat found (see Appendix B).

No rare species were encountered at Cameron Station during the site visit. Because Cameron Station is within the Atlantic flyway, a few bird species considered rare in Virginia may be found at the Station at some time during the year. These species include the American coot (*Fulica americana*), double-crested cormorant (*Phalacrocorax auritus*), green-backed heron (*Butorides virescens*), least bittern (*Ixobrychus exilis*), purple finch (*Carpodacus purpureus*), common moorhen (*Gallinula chloropus*), Forster's tern (*Sterna forsteri*), magnolia warbler (*Dendroica magnolia*), and the bank swallow (*Riparia riparia*). Forster's terns and bank swallows have also been

sighted during the spring and summer, foraging over the water at Cameron Lake and Backlick Run (VSO, 1989). Because of the absence of suitable breeding habitat, however, it is assumed that the birds are either nonbreeding adults or nesting elsewhere.

3.1.3 SOCIOECONOMIC CONDITIONS

For the purpose of socioeconomic discussions in this EIS, "region" is defined as the Washington, D.C., Metropolitan Statistical Area (MSA), which includes the District of Columbia; Montgomery County and Prince George's County in Maryland; and the counties of Arlington, Culpeper, Fairfax, Loudoun, Stafford, and Prince William and the cities of Alexandria, Fairfax, and Falls Church in Virginia.

3.1.3.1 Land Use

The large area occupied by the warehouse structures and the presence of Cameron Lake dictate the land use on the 164-acre post. Service and storage facilities comprise about 40 percent of the total land use. Administration and community facilities make up about 26 percent and 11 percent of the land use, respectively. Recreational use covers 23.5 percent and medical is less than 1 percent.

The land is currently designated as a Coordinated Development District. This resulted from a recent update of the Van Dorn-Landmark Small Area Plan, as part of the City of Alexandria's Master Plan. The city, upon learning of the closure of the post, has rezoned the land to a more restrictive mixed-use zoning, stressing residential development and open space. The existing land use in the Landmark-Van Dorn planning area, which includes Cameron Station, is a mixture of high-density residential with commercial and industrial activities. The industrial/commercial/institutional uses are made of approximately 63 percent of the land in the planning area. Residential uses make up about 25 percent, and recreational and vacant land comprise about 11 percent of the activities.

3.1.3.2 Population

3.1.3.2.1 Region. In 1988, the population of the MSA passed the 3.7-million mark. This represented an increase of 496,700 persons since 1980. In the 1970s, the region grew by an average of only 21,000 persons per year. During the 1980s, however, the region had an average growth of more than 62,000 persons per year, almost triple the previous average annual increase in population.

The central jurisdictions of the region experienced population declines in the 1970s. The District of Columbia, for example, lost residents at an average rate of 11,880 per year. The District continued to lose residents through 1984, but at a much slower rate. From 1984 through 1987 the District's population has increased slightly. Other central jurisdictions of the region that lost residents in the 1970s included Arlington County and the City of Alexandria. Both jurisdictions have registered small increases each year from 1983 through 1988.

Inner suburban counties (Montgomery, Prince George's, and Fairfax) are growing more rapidly in the 1980s than in the 1970s. Outer suburbs are growing slightly faster on an average yearly basis as well. The overall increase in population reflects the increased job growth in the region. The large increases in new jobs in the area have resulted in more migration into the area for jobs.

3.1.3.2.2 City of Alexandria. Cameron Station is located in the City of Alexandria, Virginia. Recent population trends in the City of Alexandria, presented in Table 3-1, indicate a low growth rate in comparison with the rest of the region.

Table 3-1
POPULATION TRENDS IN THE CITY OF ALEXANDRIA, 1983-1988

Year	City of Alexandria Population	Alexandria Average Annual Percent Change	Washington, D.C. MSA Average Annual Percent Change
1983	106,700	-0-	-0-
1984	107,400	0.7	1.4
1985	107,500	0.1	1.4
1986	108,500	0.9	1.8
1987	108,500	0.0	3.0
1988	109,000	0.5	3.7

Sources: Metropolitan Washington Council of Governments, 1989, local government estimates, and the Bureau of the Census.

3.1.3.2.3 Cameron Station. The current base population of Cameron Station is approximately 3,630 civilian employees and 319 military employees.

3.1.3.3 Housing

3.1.3.3.1 Region. Residential construction in the metropolitan area has been strong following the 1981-1982 recession. Total building permits issued between 1983 and 1988 ranged between 34,000 and 40,000 residential units per year. Trends in residential construction show moderate growth in the outer suburbs, substantial growth in the inner suburbs, and minimal growth in the central jurisdictions.

3.1.3.3.2 City of Alexandria. New housing in the City of Alexandria represented 1.4 percent of the total of new housing constructed in the metropolitan region during the period from 1983 through 1988. Single-family dwelling units represented 18.5 percent of the total number of residential dwelling units constructed in the City of Alexandria (Table 3-2). This was the lowest percentage of single-family dwelling units

Table 3-2 HOUSING TRENDS IN THE CITY OF ALEXANDRIA, 1983-1988				
	Total Residential Units Constructed	**Single-Family Units Constructed**	**Percent Single Family**	**Percent Of Total Region**
City of Alexandria	3,075	568	18.5	1.4
Washington, D.C., MSA	223,446	170,749	76.4	100.0
Sources:	Metropolitan Washington Council of Governments, 1989. Permit-authorized Construction in Selected Permit-Issuing Places, U.S. Department of Commerce, Bureau of the Census, C-40 Reports			

constructed in the metropolitan region, and is a reflection of the degree to which urbanization has occurred in the City of Alexandria. Regionally, 76.4 percent of the net growth in building permits issued between 1983 and 1988 was in single-family houses.

3.1.3.3.3 Cameron Station. No on-post housing exists at Cameron Station. All employees reside off post.

3.1.3.4 Employment

3.1.3.4.1 Region. The region has seen an increase of 45,600 jobs between 1983 and 1988 in the Washington, D.C., metropolitan area. The service sector represented an increasing portion of the new jobs created during this period with the addition of 199,000 new jobs. Service jobs exceeded federal jobs by 151,500 in 1983, and by 336,900 in 1988. The number of people employed by the federal government has stabilized during this period, while local government employment experienced a moderate increase.

Construction jobs increased each year following the recession of the early 1980s; however, they are currently on a downward trend. In 1988, construction jobs totaled approximately 137,300 representing a 71 percent increase from the number of construction jobs in 1983. Recently, however, the number of construction jobs has begun to decline. Employment in the finance, insurance, and real estate industries increased by more than 30 percent between 1983 and 1988. The transportation, communication, and utilities industry employment increased by 32 percent during this period.

3.1.3.4.2 City of Alexandria. The City of Alexandria experienced a 41.7 percent increase in jobs during the period from 1983 through 1988 (Table 3-3). Employment in the City of Alexandria ranged between 3.4 percent to 3.9 percent of the total number of jobs in the Washington, D.C., metropolitan area.

Table 3-3
EMPLOYMENT TRENDS IN THE CITY OF ALEXANDRIA, 1983-1988

	Non-Agricultural Wage and Salary Jobs (Thousands)						
	1983	**1984**	**1985**	**1986**	**1987**	**1988**	**Percent Change**
City of Alexandria	56.8	60.9	65.7	73.6	79.9	80.5	41.7
Percent of Total Employment in Washington, D.C., MSA	3.4	3.4	3.5	3.8	3.9	3.8	-0-

Source: Metropolitan Washington Council of Governments, 1989. Compiled from the District of Columbia Department of Employment Services, Maryland Department of Economic and Employment Development, and Virginia Employment Commission Reports.

3.1.3.4.3 Cameron Station. Cameron Station currently employs a total of 319 military and 3,630 civilian personnel, which represents approximately 5 percent of the city's employment on the basis of 1988 standards.

3.1.3.5 Income

3.1.3.5.1 Region. The District of Columbia accounted for 17.6 percent of the total regional personal income in 1983 and declined to 15.9 percent of the regional total in 1987. The Maryland suburban jurisdictions' share of the total regional income represented approximately 43 percent of the total during the period from 1983 to 1987. In Virginia suburban jurisdictions, the share of total personal income increased from 40 percent in 1983 to 41.6 percent in 1987.

3.1.3.5.2 City of Alexandria. Annual per capita personal income is the annual total personal income of residents divided by resident population as of July 1 of each year. In 1986, the City of Alexandria had the highest annual per capita personal income in the metropolitan Washington region (Table 3-4). The City of Alexandria had the second highest per capita income in the region in 1983, 1984, and 1987, and declined to third highest for the region in 1985.

Table 3-4
ANNUAL PER CAPITA INCOME IN THE CITY OF ALEXANDRIA, 1983-1987

	1983	1984	1985	1986	1987
City of Alexandria	$20,160	$22,072	$23,427	$26,030	$26,640
Washington, D.C. MSA	$16,109	$17,519	$18,935	$20,148	$21,539

Source: Metropolitan Washington Council of Governments, 1989. U.S. Department of Economic Analysis, Regional Economic Analysis, Regional Economic Information System.

3.1.3.5.3 Cameron Station. The average salary at Cameron Station is $31,033 per year for military employees and $43,374 per year for civilian employees.

3.1.3.6 Community and Army Facilities

Potable water is supplied to Cameron Station by the Virginia American Water Company through an 8-inch connection at the northeast corner of the post. In 1986 the peak flow rate was 461 gallons per minute (gpm) (U.S. Army, MDW, 1987).

Sanitary sewage from Cameron Station is treated by the City of Alexandria at the Alexandria Sanitation Authority Sewage Treatment Plant. The collection system at Cameron Station consists of several lines ranging in size from 4 to 12 inches. The system is primarily gravity flow, although it includes one lift station (U.S. Army, MDW, 1987).

Natural gas is supplied to Cameron Station by the Washington Gas Light Company from a 6-inch, high-pressure main at the west gate post boundary and through a 4-inch main at First Street. The internal distribution on Cameron Station is handled through a series of 2-inch lines (U.S. Army, MDW, 1987).

Virginia Power provides electricity to Cameron Station through a 34.5-kilovolt feeder from a substation located at Cameron Station. The maximum demand at Cameron Station in 1986 was 5,245 kilowatts (U.S. Army, MDW, 1987).

Three elementary, one junior high, and one high school are located in the neighborhoods surrounding Cameron Station. The schools are run by the City of Alexandria.

There are churches of several denominations, a hospital, and three regional parks within 5 miles of Cameron Station. In additional to regional shopping centers (e.g., Landmark Center), there are also several smaller shopping centers near Cameron Station especially along Duke and Van Dorn Streets.

The Alexandria City police provide police protection for Cameron Station. There are security guards on the post, but there is no contingent of military police stationed there. The Alexandria City fire department also provides backup support to the post during emergencies.

Cameron Station includes 29 permanent structures, nine of which are large warehouse structures. The DLA is the primary occupant, using much of their space in some of the warehouse buildings for administrative purposes. Some of the warehouse buildings are also used for the PX and the Commissary. The warehouses constitute approximately 1,229,871 square feet, or 93 percent of the total building space.

Cameron Station houses one of the world's largest commissaries. Other post facilities include:

- PX
- Data Processing Center
- Cafeteria
- Telephone exchange
- MDW Motor Pool/Maintenance Facility
- Box and Crate Shop
- Medical Clinic
- Post Headquarters
- Institute of Heraldry
- Recreational area
- Central heating plant
- Fire Station
- Security Guard Office

3.1.3.7 Traffic and Transportation

3.1.3.7.1 Definition of Level of Service. Level-of-service (LOS) analysis is a method for producing a qualitative assessment of traffic conditions based on quantitative procedures. The LOS provided by a roadway describes the quality of traffic flow as perceived by motorists. Six levels of service are defined for any LOS analysis. They are given letter designations, from A to F, with LOS A representing the best operating conditions and LOS F representing the worst.

LOS A represents free-flow conditions. Each vehicle is virtually unaffected by other vehicles in the traffic stream, and delays are minimal. LOS B and LOS C represent conditions of traffic flow with some delays caused by the presence of other vehicles in the traffic stream. At LOS D, traffic flow remains stable, but the ability to maneuver is severely restricted by the high density of traffic flow. LOS E represents traffic demand at or near capacity. Maximum throughput of a road occurs at this level of service, but drivers generally experience discomfort and frustration. LOS F occurs whenever the amount of traffic approaching a given point exceeds the amount that can pass the point. Queues develop and do not dissipate until the traffic demand has been reduced to a point below capacity.

For the analysis of intersections, quantitative values have been designated to serve as the boundaries between levels of service. An intersection is said to be operating at LOS A if the average delay per vehicle is less than 5 seconds. At the other end of the spectrum, an intersection operates at LOS F if the average delay per vehicle exceeds 60 seconds.

3.1.3.7.2 Subregional. A detailed regional and subregional transportation analysis was conducted by the Army for Cameron Station, Fort Belvoir, and EPG. The details of that study are provided in the *Fort Belvoir Regional Traffic Impact Analysis Assessment of Horizon Year Traffic Impacts* (JHK & Associates, Inc, 1990) and is included as part of this EIS by reference.

The main entrance at Cameron Station is on Duke Street. The flow and volumes of traffic are consistent with area commuting patterns between residence and work place. The post Provost Marshal has estimated daily on-post traffic at 6,000 vehicles. Because of the daily influx of Commissary patrons, peak flows in and out and the contribution to area traffic are difficult to estimate.

It is estimated that, in 1980, about 40 percent of the station personnel participated in ride sharing. The Huntington Metro Station is about 3.5 miles to the east. The planned Eisenhower Avenue Metro Station is about 0.5 miles to the southeast.

The major arterials near Cameron Station are the Capital Beltway (I-95/I-495), Shirley Highway (I-395), Duke Street, Eisenhower Avenue and Van Dorn Street.

Within the Cameron Station subregion, morning peak direction flows are generally northbound towards the District of Columbia and eastbound towards Old Town Alexandria. The primary problem intersections, within the Cameron Station area, are Edsall Road and Van Dorn Street; Eisenhower Avenue and Van Dorn Street; and South Pickett Street and Van Dorn Street. These three intersections operate at LOS F during typical morning and evening peak hours.

3.1.3.7.3 Public Transportation. Public transportation to Cameron Station, (located along the south side of Duke Street in Alexandria, Virginia), is limited to six Metrobus routes. These six routes follow three general alignments on which Cameron Station is situated.

Two of the alignments are primarily north-south, connecting Cameron Station to the Pentagon. Metrobus Route 21F is an express line to the Pentagon, traveling north on the Shirley Highway (I-395) from Duke Street (Route 236) in Alexandria. Service on Metrobus Route 8Z also provides a connection from Cameron Station to the Pentagon. Route 8Z serves the Seminary Valley, traveling north on Van Dorn Street to the Seminary Road interchange, then entering the Shirley Highway express lane toward the Pentagon.

The third alignment followed by Metrobus routes serving Cameron Station is east-west, linking Cameron Station to points east and west. Routes 29K, 29L, 29M, and 29N

provide connections from Cameron Station to the east and to Old Town Alexandria. The King Street Metrorail Station, located just west of Old Town Alexandria, is served by these routes. From King Street Station, connections can be made to National Airport, Crystal City, Pentagon, and Washington, D.C., via Metrorail. The Metrobus 29-series routes also link Cameron Station to points west. Landmark Shopping Center is served by all four routes (29K/L/M/N) providing east-west connections to Cameron Station. Three of these routes (29K/L/N) continue westward along Route 236 to Annandale and other points in Fairfax County, Virginia. Northern Virginia Community College in Annandale and George Mason University in Fairfax County are served by one route each. Travel times by Metrobus to the colleges from Cameron Station are approximately 25 minutes and 40 minutes, respectively.

Public transportation serving Cameron Station is limited, particularly during off-peak hours. Midday service is offered only on the four east-west routes. Of these, two routes offer service on weekends.

Service to the Pentagon from Cameron Station is offered only during peak hours on weekdays. Express service is limited to three morning peak-period trips toward the Pentagon and three evening peak-period trips toward Cameron Station. Service to the Pentagon through Seminary Valley is more frequent, with 12 trips north toward the Pentagon in the morning and 12 return trips toward Cameron Station in the afternoon. Geographic coverage is restricted on north-south routes serving Cameron Station, because service is primarily express to the Pentagon with a very limited number of stops along the way.

Metrobus routes operating in the east-west direction offer slightly better coverage, linking Cameron Station to specific points along Route 236 in Annandale, Fairfax County, and the City of Fairfax. These routes provide midday and weekend service and offer more stops. Geographic locations linked to Cameron Station by these routes are generally restricted to points along Route 236 with few variances.

3.1.4 CULTURAL RESOURCES

3.1.4.1 Historic Resources

A survey to identify historic resources is currently being implemented.

3.1.4.2 Archeological Resources

A survey to identify archeological resources is currently being implemented.

3.1.4.3 Visual Resources

Cameron Station is a large, orderly development of single-story buildings and parking lots relieved by two large, open green areas. The area surrounding Cameron Station is generally of a poor visual quality, related to the commercial and industrial development, which includes car dealerships, discount department stores, and fast food outlets.

3.1.5 HAZARDOUS MATERIALS

USATHAMA has prepared a Preliminary Assessment (PA) for Cameron Station. The objectives of this study were to review current and past records and studies, as well as to interview appropriate personnel. On the basis of these activities, the report identifies the following:

- Areas and operations that may have affected the environment and that require additional environmental investigation
- Areas that would require immediate remedial action
- Environmental concerns that could present impediments to the expeditious transfer of the property

The PA identified a number of potential environmentally significant operations, including electrical transformers containing PCBs that were awaiting removal or retrofitting; underground storage tanks; hazardous materials storage; incinerator emissions; asbestos in several buildings; leaky drums; and fuel spills.

The following conclusions were provided in the PA:

- *Groundwater.* Should a release from Cameron Station occur, it would not directly affect present drinking water supplies. Homes and businesses in the immediate area of the property purchase water from the American Waterworks Company, which is supplied by the Fairfax County Water Authority (FCWA) from the Occoquan Creek Reservoir. The Virginia State Water Pollution Control Board has no record of permits issued for any wells to be used as a public drinking water supply near Cameron Station. Generally, groundwater in the area is of poor quality and is not used as a drinking water source.

- *Surface Water.* Holmes Run and Backlick Run are too shallow to support fish. A fishkill at Cameron Lake was reported in March 1974 and investigated by the State Water Pollution Control Board. On the basis of the Board's analysis of oily substances, the report implicated a recent roof-asphalting operation as the cause of the fishkill. A fishkill at Cameron Lake was reported in 1975 and investigated by the U.S. Army Environment and Hygiene Agency (USAEHA). On the basis of an assessment and sampling of dead fish, the USAEHA concluded that dissolved oxygen levels in the pond were low because of hot, humid, and overcast weather. These conditions combined with stress associated with a reported gasoline spill of unknown volume at the PX gas station on May 9, 1975, produced the fishkill. The USAEHA recommended that petroleum products be prevented from entering the ponds and that the latter be dredged to maintain water depth and remove accumulated

sediments. Thus, the ponds have been periodically dredged and the sediments transported to a landfill south of Cameron Station.

- *Air Quality*. Although Cameron Station has been cited for violations of excess smoke emissions from its incinerator, for the most part the base is operating well within the state guidelines. According to officials at the Air Pollution Control Board in Alexandria, Virginia, the recent violations for excessive smoke were the result of the manner in which post employees loaded the incinerator. Recent MDW recommendations prohibited the incineration of film and microfiche and the practice has been discontinued. Air emissions from Cameron Station do not contribute significantly to air quality degradation in the National Capital Interstate AQCR.

Conclusions and recommendations in the PA were used to develop the remedial investigation/feasibility study (RI/FS), which followed EPA's guidance on Comprehensive Environmental Response Compensation and Liability Act (CERCLA)/ Superfund Amendments and Reauthorization Act (SARA) and has been approved by the regulatory agencies. The RI/FS describes a sampling analysis and an alternatives assessment program for Cameron Station, which consists of separate plans for accident prevention and safety plan project quality control, sampling design, and projects.

The objective of the RI/FS is to characterize sites and develop and evaluate remedial action alternatives. Specific objectives are:

- The definition of the nature, magnitude, and extent of any environmental contamination
- The development of information to adequately assess the health and environmental risks associated with closure and transfer of Cameron Station for other uses
- The determination of the necessity for remedial actions
- The development and evaluation of remedial action alternatives so the Army can make a decision regarding the preparation of the property for release

The RI/FS is being conducted in accordance with the EPA Interim Final Guidance on RI/FS under CERCLA, published in October 1988, as well as updates of this guidance concerning SARA and the National Contingency Plan. The RI/FS also incorporates the applicable requirements of the National Environmental Policy Act of 1969 (NEPA) and AR 200-1 and 200-2.

The field investigation (FI) began in August 1990 and is being conducted in accordance with the activities specified in the Cameron Station RI/FS. The field investigation involves the investigation and evaluation of the areas identified in the RI/FS through

field sampling, laboratory analysis, and subsequent evaluation in accordance with CERCLA/SARA and Virginia requirements. The RI/FS is carried out using required and approved sampling procedures and analytical parameters. Fieldwork includes a soil-gas survey; investigations of surface and subsurface soils, geophysical and hydrogeological conditions, PCBs; and an asbestos survey and assessment.

The following areas of potential environmental concern are being investigated:

- ***Asbestos-containing material.*** Buildings 3, 4, 8, 15 and 17 have been surveyed on a limited basis and some abatement actions have been taken. Pipe insulation, floor tiles, and perhaps ceiling tiles may contain asbestos and are in various states of disrepair. An asbestos survey plan, which supplements the previous asbestos work, is being prepared before the sampling begins. The survey will include bulk sampling. Following an analysis and evaluation of the survey, an asbestos survey report will be prepared, which will accompany the remedial investigation (RI) report. This report will detail the results of the asbestos sampling, the locations and quantities of the asbestos within the buildings, the assessment of risks, and the recommendations for remedial action. The survey will be performed in accordance with 40 CFR Part 763; the Asbestos Hazard Emergency Response Act; U.S. Technical Manual No. 5-615; U.S. Army Technical Bulletin, Medical, No. 513; and AR 200-1.

- ***USTs.*** There are approximately 21 USTs in service at Cameron Station and possibly as many as four abandoned tanks. The objectives of the UST program are to locate all tanks, to determine their contents and integrity, and to determine the extent of environmental impact. As a first step, USATHAMA tested the integrity of all tanks to better identify the potential for leaks. This testing was supplemented by a soil-gas sampling to further estimate the extent of environmental impact. Limited geophysical surveys are being performed to confirm the location of the abandoned tanks. Abandoned tanks that are leaking will be removed and the soils in the excavated pit will be sampled. To obtain information before in-service tanks are removed, sites of non-leaking tanks are being characterized using one soil boring and sites of leaking tanks are being evaluated using four borings. Soils will be analyzed for total petroleum hydrocarbons, unless tank contents are unknown, in which case the soils will be analyzed for the full EPA toxic compound list (TCL). In addition to the USTs, a septic tank is near Building 30 and evidence exists of two additional underground tanks (at Buildings 5 and 8) whose use and contents are unknown. These tanks will be located using geotechnical techniques and their contents will be characterized. The surface and subsurface soils around the Building 30 septic tank will be sampled and tested for pesticides during the monitoring well installation in this area. Samples from two grease traps in Buildings 7 and 23 will be analyzed for total petroleum hydrocarbons and the TCL contaminants.

- ***Sanitary and Storm Sewer Lines.*** Small quantities of liquid chemical wastes have been disposed of through the sanitary sewer system. These wastes include solvents, corrosive materials used in film processing, washwater from battery charging areas, paints, and inks. Also evidence exists of previous limited use of a wash rack to dispose of used motor oil (for personal vehicle maintenance) into the storm sewer system. A sewer line study will identify any environmental contamination caused by these activities. A spot check of the system will be made using a remote-camera survey of a portion of the systems that received these wastes in order to ascertain the potential for leaks. Where significant potential for leaks is identified, the soil will be sampled.

- ***Road Oiling and Fly-Ash Disposal.*** The reported use of waste oil, which was used to control dust along a portion of a road in the southwest corner of the facility, requires investigation. This area is being investigated using a soil-gas survey and limited surface and subsurface soil sampling. Installation of a shallow groundwater-monitoring well is also required to characterize this area.

- ***PCB Transformers.*** The areas around the four PCB-contaminated transformers will be sampled to determine the extent of contamination. Building 9, the outside storage yard, will also be investigated. A spill of approximately three gallons of PCB-contaminated oil in this yard is recorded. In addition, temporary storage of drums and contaminated transformers in this area has resulted in the soil being stained. The extent of environmental contamination will be determined through wipe sampling and soil sampling as detailed in the RI/FS. The installation of a groundwater monitoring well in this area, with associated surface soil sampling, is required to characterize this site.

- ***Burning Pits and Dredge-Spoil Disposal Area.*** A portion of the South Pond of Cameron Lake was reportedly used as a burning pit during the late 1950s. Also, dredge spoils from Cameron Lake were deposited in an adjacent area. This location may have been a disposal site for general debris as well. Geophysical and soil-gas surveys have been performed in these areas to screen for potential contamination. Confirmatory surface and subsurface soil sampling is also required, as is the installation of a shallow groundwater-monitoring well in the dredge disposal area.

- ***Landfills***. Very little historical information about the landfilling operations has been identified. The landfill area is currently covered with an undetermined thickness of soil and limited construction rubble is still evident. No visible evidence exists of leachate seepage along the slopes, which are adjacent to Backlick Run; however, the area must be evaluated for potential environmental contamination. A geophysical and a soil-gas survey of the area will be performed to determine the vertical and horizontal extent and general type of fill material. Surface and subsurface soils and a nearby culvert will also be sampled and analyzed for the TCL contaminants. Wells will be installed and the groundwater analyzed for the TCL contaminants.

- ***Pesticides***. A variety of pesticides and herbicides have been used at Cameron Station. Most of this use has been along rail and fence lines. Surface soil samples will be collected and analyzed for herbicides and pesticides to characterize the extent of potential environmental impact. In addition, installation of a shallow groundwater-monitoring well is required to examine subsurface soils and groundwater quality.

- ***Miscellaneous***:

  - Radon: Currently, the installation is conducting a comprehensive radon survey in accordance with the Army's radon program. The results will be incorporated into the RI/FS.

  - Abandoned Wells: Two abandoned drinking-water wells are located in the vicinity of the water tower. Recommendations will be developed for appropriate closure of these wells.

  - Pigeon Droppings: Pigeon droppings have accumulated on Building 21 and there is a concern that these droppings may be associated with *Cryptococcus neoformens* fungus contamination. The extent of this problem will be determined and recommendations developed for remediating the condition.

  - Buried Transformer: Geophysical techniques are being used in parking lot number 2 and near Building 17 to determine the validity of a report that a transformer has been buried in one of these locations.

3.2 FORT BELVOIR

3.2.1 PHYSICAL/CHEMICAL RESOURCES

3.2.1.1 Physiography and Topography

Fairfax County, including Fort Belvoir, lies in both the Upper Coastal Plain and the Northern Piedmont physiographic provinces. The Piedmont is generally confined to the north of U.S. Route 1 and the Coastal Plain extends to the south of Route 1 (U.S. Department of Agriculture, 1982). This combination of provinces and the effects of dissection by rivers and streams has influenced the topography at Fort Belvoir. Fort Belvoir consists of 8,656 acres and land features range from smooth uplands to bluffs and V-shaped valleys that rise abruptly from the floodplain and include well to moderately drained uplands and well to poorly drained lowlands. The highest elevations on the Main Post are approximately 230 feet above mean sea level (MSL) along Beulah Street between Woodlawn Road and the North Post Club House Road. Elevations of 0 to 1 foot above MSL occur along the shorelines to the south and east of the post. Elevations at the EPG range from approximately 100 to 300 feet above MSL.

3.2.1.1.1 BRAC 1. The preferred alternative for BRAC 1 is relatively flat with a gradual elevation change from 75 to 125 feet above MSL. The northern boundary drops abruptly to a stream valley. The slopes are greater than 15 percent and are included within the RPA for the stream.

Alternative 2 for BRAC 1 is composed of a well-developed stream valley and broad plateau. The majority of the slopes associated with the stream valley are greater than 15 percent. As a result, the buildable area for this site is limited to elevations above 125 feet MSL.

Alternative 3 for BRAC 1 involves building renovations and not new construction. As a result, topography and physiography discussions would not apply to this alternative.

3.2.1.1.2 BRAC 2. The preferred alternative for the industrial park is located in an area that has been heavily disturbed by past activities. The elevation averages 100 feet above MSL. There is very little relief at this site.

Alternative 2 is located within the training area of South Post. The site ranges in elevation from 150 feet above MSL near the northeastern boundary to 125 feet above MSL. A small swale also bisects the site.

3.2.1.1.3 BRAC 3. The topography along the preferred alignment for the BRAC Roads, North, undulates mildly from Beulah Street to Woodlawn Road. There are six streams that cross the alignment corridor and several other swales. The western portion of the alignment is relatively flat.

The alternative alignment for the roadway crosses three streams, but is still relatively level throughout its length.

The topography along the alignment for the preferred alternative for BRAC 3, South, is relatively flat. The southern portion of the road crosses a small swale that contains an intermittent stream.

3.2.1.1.4 BRAC 4, BRAC 5, and BRAC 6. Both the preferred alternative and Alternative 2 for each of these projects have very little relief. In all cases, past activities have almost leveled the sites.

3.2.1.1.5 BRAC 7. This project involves building renovations and not new construction. As a result, topography and physiography discussions do not apply to this alternative.

3.2.1.1.6 BRAC 8. The preferred alternative for this project is located within the BRDEC complex at Fort Belvoir on a plateau with an average elevation of 125 feet above MSL. The western edge of the site slopes to the west to an unnamed tributary of the Potomac River.

Alternative 2 for this project is a plateau that is surrounded by steep slopes in excess of 15 percent. As a result, the buildable area on this site is confined to elevations above 125 feet MSL.

3.2.1.1.7 BRAC 9. As with BRACs 4, 5, and 6, both of the alternatives for this project are located in areas that have been heavily disturbed in the past and the topography is relatively flat.

3.2.1.1.8 BRAC 10. Like BRAC 7, this project involves building renovations and not new construction. As a result, topography and physiography discussions do not apply to this alternative.

3.2.1.2 Geology and Groundwater

Metamorphic gneiss and schist of Precambrian age and early Paleozoic (Cambrian) granitic intrusives make up the rocks of the Piedmont Upland. Minor amounts (about 5 percent) of unmetamorphosed Triassic red beds of sandstone, conglomerate, and silt with intrusive dikes and sills of diabase occur in the Piedmont Plateau (Hunt, 1974).

In the Coastal Plain, unconsolidated and poorly consolidated sand and gravel of younger Cretaceous age, with lesser amounts of silt and clay, are found. Deposited in fluvial-deltaic continental and marginal marine environments, these deposits form a sedimentary wedge that thickens southeastward from the fall line (i.e., approximately along I-95) (Meng and Harsh, 1988).

A generalized geologic cross section from EPG eastward to approximately Dogue Creek about one mile east of the northernmost boundary of the HEC, is shown in Figure 3-2. Regional configurations of major fault systems and deflections of rivers such as the Potomac, along the northeast-trending fall line, suggest that these are tectonically influenced (Mixon and Newell, 1977). The Stafford Fault System, a series of northeast-trending, high-angle reverse faults parallel to the fault line, extends into Fort Belvoir and EPG. No evidence exists of recent structural disturbances in the Fort Belvoir area (Mixon and Newell, 1977).

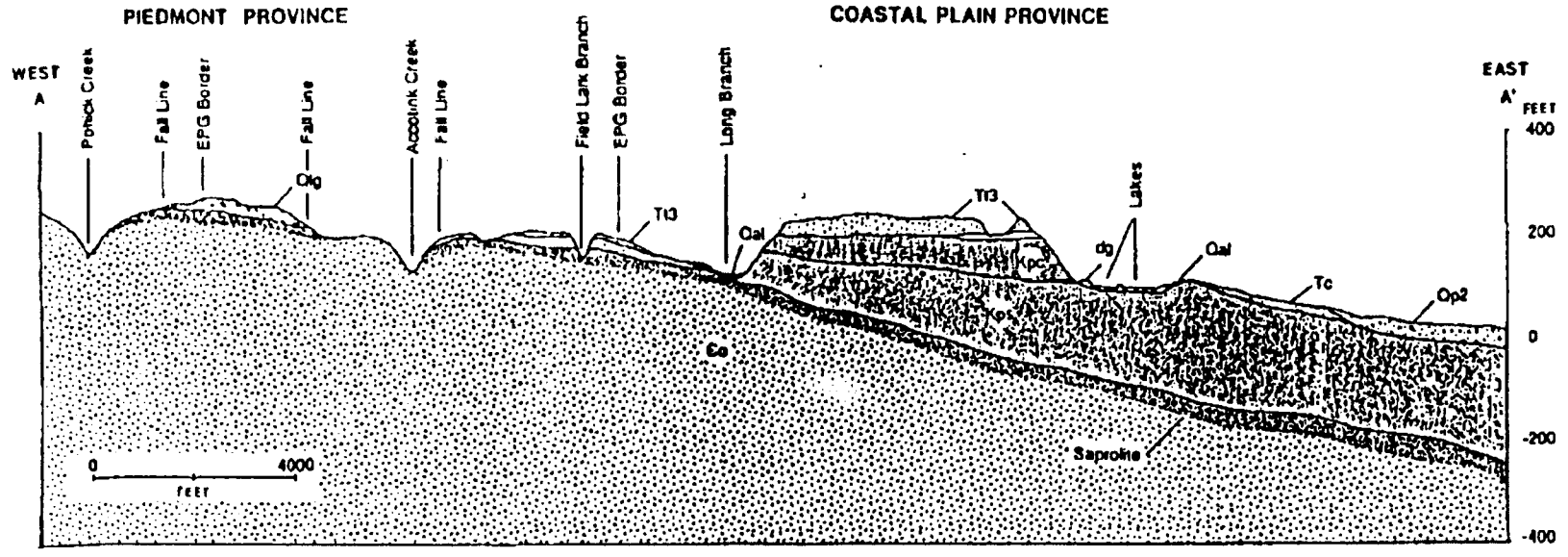
The hydrogeology of the Virginia Coastal Plain region has been summarized by Meng and Harsh (1988). In the vicinity of the fall line, the three major aquifers are the Lower Potomac aquifer, the Middle Potomac aquifer, Aquia aquifer. These units are separated by three confining units--the Lower Potomac confining unit, the Middle Potomac confining unit, and the Nanjemoy-Marlboro clay confining unit.

The Potomac aquifers are major components of the Potomac Formation. These aquifers consist of fluvial-deltaic and marginal-marine sediments and rest nonconformably on the basement rock. The Potomac Formation is a massive eastward-thickening wedge of sediments that range in grain size from gravels and sands to silts and clays (Meng and Harsh, 1988).

The Potomac aquifers traditionally have been good sources of groundwater throughout the northern Virginia Coastal Plain (Cady, 1938). Groundwater is withdrawn from the Lower Potomac aquifer mostly in the western area of the Coastal Plain, while in the eastern and central areas of the Coastal Plain, groundwater is withdrawn from the Middle Potomac aquifer (Meng and Harsh, 1988). This is probably an artifact of both the depth and thickness of the aquifers. In the east, it is more difficult to extract groundwater from the Lower Potomac aquifer because of its greater depth. In the west, the Middle Potomac may be too thin or discontinuous to produce adequate amounts of groundwater.

The massive Aquia aquifer, which is composed of marine sediments, has been a good source of groundwater throughout the Coastal Plain. Groundwater from the Aquia aquifer is withdrawn in the central and west-central areas north of the Norfolk Arch (Meng and Harsh, 1988).

In addition to the sedimentary aquifer, groundwater supplies are also developed from the underlying metamorphic rocks. On the Lower Piedmont Province, groundwater was produced successfully from the Wissahickon schist for the City of Fairfax, where a municipal well produced as much as 70 gal/min. In addition, a number of private wells also obtain groundwater from this formation (Cady, 1938). On Fort Belvoir, wells finished at depths of 98 feet or more, in general, reportedly delivered up to 250 gallons per minute (gal/min) of water (Ludemann et al., 1982).



Sedimentary Rocks

- dg — Disturbed ground, areas cut for sand and gravel extraction
- Qal — Alluvium (Holocene); sand, silt, gravel, and clay
- Qlg — Lag gravel (Holocene and Pleistocene); cobbles, pebbles, and boulders
- Op2 — Terrace and estuarine (?) deposits (Pleistocene); silt, clay, sand, and gravel with minor peat beds
- Tc — Colluvium (Holocene to Miocene?)
- Tl3 — Terrace gravel (Pliocene?); cobble and pebble gravel interbedded with fluvial sand, silt, and clay
- Xps — Potomac Formation (Early Cretaceous); sand and gravel
- Xpc — Potomac Formation (Early Cretaceous); clay and silt
- Saprolite clay; residuum from chemical weathering of granite

Intrusive Rocks

- Ca — Occoquan Granite (Cambrian); medium- to coarse-grained muscovite-biotite granite showing some mica foliation

Source: Based on Drake and Froelich 1986

Figure 3-2
Generalized Geologic Cross Section of the EPG and Fort Belvoir Areas

The thickness of the unsaturated zone probably varies widely with the top of the water-table occurring from near the land surface to appreciable depths. This is indicated by the groundwater springs found in areas west of Accotink Bay and along Poe Road on Fort Belvoir. It is not unreasonable to expect the thickness of the unsaturated zone in the lower Piedmont Province to be very different from Coastal Plain conditions.

Froelich and Zenone (1985) have shown that groundwaters of the Piedmont are characterized as mostly soft to moderately hard, with a median total dissolved solids concentration of 85 milligrams/liter from 24 samples. In the Coastal Plain, groundwater quality varies widely, and strongly depends on whether mixing with saltwater has occurred. Because of this phenomenon, concentrations of dissolved chloride and other chemical species vary within the region. Overall, the water is characterized as soft. The qualities of the groundwater in the two provinces are provided in Table 3-5, which presents analyses of water collected from one U.S. Geological Survey well located in the Coastal Plain at Fort Belvoir, and another well located in the Piedmont Upland near EPG.

Site-specific groundwater investigations have not been completed for the alternative sites for the BRAC actions to date. However, preliminary research indicates none of the alternatives appear to have been sited in areas that may have significant geologic or groundwater constraints.

3.2.1.3 Soils

Fort Belvoir occupies approximately 13.5 square miles in the southeastern portion of Fairfax County, Virginia. The area is, in general, nearly level to sloping, except along the Potomac River and larger creeks and streams where slopes are steep or very steep.

The soils in the area, including Fort Belvoir, have formed from metamorphic rocks--granite gneiss and quartz sericite schist--similar to those in the Piedmont Upland. The sedimentary deposits in which soils have formed are of fluvial and marine origin. Many soils formed in fluvial and alluvial sediment have a fragipan that causes them to drain slowly. This sedimentary material usually occupies the broader ridgetops that have gentle to undulating slopes of less than 10 percent. The mixed Piedmont Upland and High Coastal Plain terraces in this area are drained mainly by Accotink and Pohick Creeks into the Potomac River. The drainage pattern is generally dendritic.

The High Coastal Plain consists almost entirely of Coastal Plain sand, silt, clay, and gravel of marine or fluvial origin that overlie Piedmont Upland material, mainly granite gneiss and sericite schist. Between this section and the low Coastal Plain are hilly and steep areas along the large streams and near the breaks. Most of the section consists of wide upland ridges that are undulating and rolling. The drainage is well developed and generally toward the southeast. Accotink Creek is the main drainage into the Potomac. Slowly permeable and gravelly soils are common throughout this section.

Table 3-5
ANALYTIC RESULTS FOR GROUNDWATER FROM A COASTAL PLAIN WELL AND A PIEDMONT WELL

Analyte	Concentration (mg/l)[a]	
	Coastal Plain	Piedmont
Iron	0.59	0.1
Calcium	7.1	19.0
Magnesium	6.7	0.7
Sodium	26.0	5.6
Potassium	-[b]	0.2
Bicarbonate	107.0	-
Sulfate	11.0	0.8
Chloride	2.1	3.0
Fluoride	0.1	0.1
Nitrate	0.3	-
Silica	25.0	-
Total dissolved solids	126.0	71.0
Alkalinity[c]	-	41.0
Hardness[c]		
Calcium and magnesium	47.0	-
Noncarbonate	0	-
Specific conductance	177.0	-
(μohm/cm at 25°C)[d]		

[a]Measured in milligrams/liter except as noted for conductance.
[b]"-" indicates no value reported.
[c]As calcium carbonate.
[d]μohm/cm = microhom per centimeter.
Source: Froelich and Zenone, 1985.

WDCR504/007.51

The Low Coastal Plain terrace is a young marine deposit consisting of highly stratified and mixed sand, silt, clay, and gravel. The topography is mostly level and very gently undulating but there are small areas of rolling hilly terrain near the large creeks and rivers. The general drainage patterns are not well developed.

The following tables provide summary information for the soil types within the proposed project boundaries at Fort Belvoir. Table 3-6 presents the soil types found at each BRAC project site, the percentage of each soil type, and any associated building constraints. Table 3-7 provides the same information for Concept Development Plan project sites.

Because some of the projects in each group are not buildings, but rather road improvement or other projects, which are linear in nature, linear projects are described slightly differently in these tables. Section B of each table indicates those soils that are present within a linear project area, the building constraints associated with the soil types, and an estimate of the percentage of soils that may present development constraints. When these projects are designed, the soil survey map can be used to identify the locations of the various types of soils likely to be encountered.

3.2.1.4 Surface Water

Fort Belvoir lies within the Accotink Creek and Dogue Creek watersheds. The headwaters for Accotink Creek begin north near Vienna, Virginia, and west near Fairfax, Virginia. Accotink Creek runs in a south-southeasterly direction through Fairfax County, and through EPG and Fort Belvoir. The creek flows through Fort Belvoir's training area and wildlife preserve, eventually reaching the Potomac River by way of Accotink Bay and Gunston Cove. The U.S. Geological Survey water-stage recorder nearest to Fort Belvoir on Accotink Creek in Annandale, Virginia, about four miles upstream from EPG is number 01654000. At this point, Accotink Creek's drainage area is 23.5 square miles and its average discharge for the 41-year record is 27.4 cubic feet per second.

The watershed of Dogue Creek is smaller than that of Accotink; its headwaters begin near Rose Hill, Virginia, and flow south across Telegraph Road, through Fort Belvoir and the Woodlawn and Mt. Vernon subdivisions, into the Potomac River. In 1989 the SWCB conducted a stream survey of Dogue Creek and Piney Branch (SWCB, 1989). All samples taken within Fort Belvoir were found to comply with state water quality standards for nutrients, biological and chemical oxygen demand, total organic carbon, and metals (arsenic, cadmium, chromium, copper, iron, lead, mercury, nickel, and zinc).

Potomac River waters adjacent to Fort Belvoir receive discharges from Dogue, Accotink, and Pohick Creeks. Accotink Bay and Pohick Bay are two small embayments that join their respective creeks with Gunston Cove, which opens out into the Potomac River. Pohick and Accotink Bays are very shallow, with average depths from 0.5 to 2.0 feet. Water depth in most of Gunston Cove ranges from 5 to 7 feet and is much shallower (1 to 2 feet) close to shore.

Table 3-6
SOIL TYPE AND BUILDING CONSTRAINTS
FOR FORT BELVOIR BRAC ACTIONS

Action	Soil Type	Percent Soil on Site	Building Constraint
A. Building Projects			
BRAC 1 Preferred Alternative	UB Urban Built Up	50	none
	C+F Cut and Fill	40	none
	61C Dumfries Sandy Loam	5	none
Building Constraint Summary: None			
BRAC 1 Alternative 2	Soil survey incomplete, subsurface investigations required		
Building Constraint Summary: Unknown at this time			
BRAC 1 Alternative 3	UB Urban Built Up	100	none
Building Constraint Summary: None			
BRAC 2 Preferred Alternative	37B Beltsville Silt Loam	100	high water table
Building Constraint Summary: 100% high water table			
BRAC 2 Alternative 2	37B Beltsville Silt Loam	20	high water table
	46B Mattapex Sandy Loam	70	high water table
	6B Wehadkee Silt Loam	10	hydric soil
Building Constraint Summary: 10% hydric soil, 90% high water table			
BRAC 3 - Road improvement - see part B, Linear Projects, below			
BRAC 4 Preferred Alternative	UB Urban Built Up	25	none
	38B Beltsville Loam	25	high water table
	45B Matapeake Silt Loam	50	none
Building Constraint Summary: 25% high water table			
BRAC 4 Alternative 2	UB Urban Built Up	100	none
Building Constraint Summary: None			
BRAC 5 Preferred Alternative	38B Beltsville Loam	100	high water table
Building Constraint Summary: 100% high water table			

Table 3-6
SOIL TYPE AND BUILDING CONSTRAINTS
FOR FORT BELVOIR BRAC ACTIONS

Action	Soil Type	Percent Soil on Site	Building Constraint
BRAC 5 Alternative 2	UB Urban Built Up	100	none
Building Constraint Summary: None			
BRAC 6 Preferred Alternative	UB Urban Built Up	100	none
Building Constraint Summary: None			
BRAC 6 Alternative 2	UB Urban Built Up	100	none
Building Constraint Summary: None			
BRAC 7 Preferred Alternative	UB Urban Built Up	100	none
Building Constraint Summary: None			
BRAC 8 Preferred Alternative	C+F Cut and Fill	85	none
	37B Beltsville Silt Loam	15	high water table
Building Constraint Summary: 15% high water table			
BRAC 8 Alternative 2	37B Beltsville Silt Loam	75	high water table
	61D Dumfries Sandy Loam	15	steep slope
	UB Urban Built Up	10	none
Building Constraint Summary: 75% high water table, 15% steep slope			
BRAC 9 Preferred Alternative	UB Urban Built Up	100	none
Building Constraint Summary: None			
BRAC 9 Alternative 2	37B Beltsville Silt Loam	40	high water table
	45B Matapeake Silt Loam	50	none
	45C Matapeake Silt Loam	10	none
Building Constraint Summary: 40% high water table			
BRAC 10	UB Urban Built Up	100	none
Building Constraint Summary: None			

Table 3-6
SOIL TYPE AND BUILDING CONSTRAINTS
FOR FORT BELVOIR BRAC ACTIONS

Action	Soil Type	Building Constraint
B. Linear Projects		
BRAC 3, North Preferred Alternative	C+F Cut and Fill	none
	UB Urban Built Up	none
	1 Mixed Alluvial Fill	hydric soil
	37B Beltsville Silt Loam	high water table
	45B Matapeake Silt Loam	none
	45C Matapeake Silt Loam	none
	46B Mattapex Sandy Loam	high water table
	46C Mattapex Sandy Loam	high water table
	53B Lenoir Silt Loam	hydric soil
	54C Sassafras Fine Sandy Loam	none
	61C Dumfries Sandy Loam	none
	61D Dunfries Sandy Loam	steep slope
	61E Dumfries Sandy Loam	steep slope
Building Constraint Summary: 7% hydric soil/19% high water table/11% steep slopes		
BRAC 3, North Alternative 2	C+F Cut and Fill	none
	Urban Built Up	none
	1 Mixed Alluvial Fill	hydric soil
	37B Beltsville Silt Loam	high water table
	45C Matapeake Silt Loam	none
	46B Mattapex Sandy Loam	high water table
	61C Dumfries Sandy Loam	none
	61D Dumfries Sandy Loam	steep slope
Building Constraint Summary: 5% hydric soil/15% high water table/10% steep slopes		

Table 3-6
SOIL TYPE AND BUILDING CONSTRAINTS
FOR FORT BELVOIR BRAC ACTIONS

Action	Soil Type	Building Constraint
BRAC 3, South Preferred Alternative	61C Dumfries Sandy Loam	none
	37BBeltsville Silt Loam	high water table
	UBUrban Built Up	none
Building Constraint Summary: 5% high water table		

WDCR504/008.51

Table 3-7
SOIL TYPE AND BUILDING CONSTRAINTS FOR PROPOSED CONCEPT DEVELOPMENT PLAN ACTIONS AT FORT BELVOIR

Action	Soil Type	Percent Soil on Site	Building Constraint
A. Building Projects			
AFH 3	1 Mixed Alluvial Land	5	hydric soil
	26B Bertie Silt Loam	5	high water table
	35B Dumfries Sandy Loam	5	high water table
	36B Bertie Silt Loam	5	high water table
	37B Beltsville Silt Loam	35	high water table
	45B Matapeake Silt Loam	5	none
	45C Matapeake Silt Loam	10	none
	46C Mattapex Silt Loam	5	high water table
	54B Sassafrass Sandy Loam	5	none
	61B Dumfries Sandy Loam	5	none
	61C Dumfries Sandy Loam	10	none
	61D Dumfries Sandy Loam	5	steep slope
NAF 1	UB Urban Built Up	100	none
NAF 2	46B Mattapex Silt Loam	20	high water table
	61E Beltsville Silt Loam	80	steep slope
NAF 3	45B Mattapeake Silt Loam	25	none
	46B Mattapex Silt Loam	25	high water table
	61C Dumfries Sandy Loam	50	none
NAF 4	UB Urban Built Up	100	none
NAF 5	C+F Cut and Fill	<5	none
	1 Mixed Alluvial Land	10	hydric soil
	37B Beltsville Silt Loam	30	high water table
	45B Matapeake Silt Loam	5	none
	45C Matapeake Silt Loam	<5	none
	46B Mattapex Silt Loam	<5	high water table
	46C Mattapex Silt Loam	<5	high water table

Table 3-7
SOIL TYPE AND BUILDING CONSTRAINTS FOR PROPOSED CONCEPT DEVELOPMENT PLAN ACTIONS AT FORT BELVOIR

Action	Soil Type	Percent Soil on Site	Building Constraint
NAF 5 (cont'd)	61D Dumfries Sandy Loam	20	steep slope
	61E Dumfries Sandy Loam	20	steep slope
NAF 6	UB Urban Built Up	100	none
NAF 7	C+F Cut and Fill	100	none
NAF 8	37A Beltsville Silt Loam	75	high water table
	45B Matapeake Silt Loam	25	none
AAFES 1	UB Urban Built Up	100	none
AAFES 2	26B Bertie Silt Loam	50	high water table
	46B Mattapex Silt Loam	50	high water table
AAFES 3	UB Urban Built Up	100	none
MCA 6	34B Woodstown Sandy Loam	100	high water table
MCA 7a	UB Urban Built Up	100	none
MCA 7b	UB Urban Built Up	100	none
MCA 7c	UB Urban Built Up	100	none
MCA 8 - Post-wide telephone switch upgrade, n/a			
MCA 9	C+F Cut and Fill	100	none
MCA 10	45B Matapeake Silt Loam	25	none
	46B Mattapex Silt Loam	25	high water table
	61C Dumfries Sandy Loam	50	none
MCA 11 - Post-wide main sewer line upgrade, n/a			
MCA 12	UB Urban Built Up	100	none
MCA 13	UB Urban Built Up	50	none
	37B Beltsville Silt Loam	50	high water table
MCA 14	UB Urban Built Up	100	none
MCA 15	UB Urban Built Up	90	none
	51B Keyport Silt Loam	10	high water table

Table 3-7
SOIL TYPE AND BUILDING CONSTRAINTS FOR
PROPOSED CONCEPT DEVELOPMENT PLAN ACTIONS AT FORT BELVOIR

Action	Soil Type	Percent Soil on Site	Building Constraint
MCA 16 - Road improvement - see Part B, Linear Projects, below			
MCA 17	UB Urban Built Up	80	none
	49 BLunt Fine Sandy Loam	20	none
MCA 18	UB Urban Built Up	100	none
MCA 19	UB Urban Built Up	100	none
MCA 20	UB Urban Built Up	100	none
MCA 21	UB Urban Built Up	35	none
	51A Keyport Silt Loam	60	high water table
	1 Mixed Alluvial Land	5	hydric soil
MCA 22 - Post-wide electrical upgrade, Phase I, n/a			
MCA 23 - Post-wide lateral sewer line repair, n/a			
MCA 24	UB Urban Built Up	10	none
	37B Beltsville Silt Loam	30	high water table
	46B Mattapex Silt Loam	20	high water table
	61C Dumfries Sandy Loam	20	none
	61D Dumfries Sandy Loam	10	steep slope
	61E Dumfries Sandy Loam	10	steep slope
MCA 25	36A Bertie Silt Loam	20	high water table
	37A Bertie Silt Loam	60	high water table
	61C Dumfries Sandy Loam	20	none
MCA 26	UB Urban Built Up	100	none
MCA 27	UB Urban Built Up	100	none
MCA 28	UB Urban Built Up	35	none
	51A Keyport Silt Loam	60	high water table
	1 Mixed Alluvial Land	5	hydric soil
MCA 29	UB Urban Built Up	100	none
MCA 30 - No project with this number			

Table 3-7
SOIL TYPE AND BUILDING CONSTRAINTS FOR PROPOSED CONCEPT DEVELOPMENT PLAN ACTIONS AT FORT BELVOIR

Action	Soil Type	Percent Soil on Site	Building Constraint
MCA 31 - Road improvement - see Part B, Linear Projects, below			
MCA 32	UB Urban Built Up	100	none
MCA 33	UB Urban Built Up	100	none
MCA 34	UB Urban Built Up	100	none
MCA 35	UB Urban Built Up	100	none
MCA 36	37A Beltsville Silt Loam	80	high water table
	37B Beltsville Silt Loam	5	high water table
	61C Dumfries Sandy Loam	15	none
MCA 37	46B Mattapex Silt Loam	50	high water table
	61C Dumfries Sandy Loam	50	none
MCA 38	UB Urban Built Up	100	none
MCA 39	UB Urban Built Up	100	none
MCA 40	UB Urban Built Up	100	none
MCA 41	UB Urban Built Up	100	none
MCA 42	1 Mixed Alluvial Land	10	hydric soil
	6B Wehadkee Silt Loam	10	hydric soil
	37B Beltsville Silt Loam	12	high water table
	45B Matapeake Silt Loam	15	none
	45C Matapeake Silt Loam	5	none
	46B Mattapex Silt Loam	8	high water table
	49 Blunt Fine Sandy Loam	<5	none
	61B Dumfries Sandy Loam	5	none
	61C Dumfries Sandy Loam	10	none
	61D Dumfries Sandy Loam	20	steep slope

Table 3-7
SOIL TYPE AND BUILDING CONSTRAINTS FOR PROPOSED CONCEPT DEVELOPMENT PLAN ACTIONS AT FORT BELVOIR

Action	Soil Type	Building Constraint
B. Linear Projects		
MCA 16	UB Urban Built Up	none
	1 Mixed Alluvial Land	hydric soil
	6 Wehadkee Silt Loam	hydric soil
	26B Bertie Silt Loam	high water table
	37B Beltsville Silt Loam	high water table
	46C Mattapex Sandy Loam	high water table
	61C Dumfries Sandy Loam	none
	61D Dumfries Sandy Loam	steep slope
Building Constraint Summary: 27% hydric soil / 5% high water table / 2% steep slope		
MCA 31	C+F Cut and Fill	none
	UB Urban Built Up	none
	1 Mixed Alluvial Land	hydric soil
	34B Woodstown Fine Sandy Loam	high water table
	37B Beltsville Silt Loam	none
	45C Matapeake Silt Loam	none
	61C Dumfries Sandy Loam	steep slope
	61D Dumfries Sandy Loam	steep slope
	61E Dumfries Sandy Loam	hydric soil
	84A Fallsington Fine Sandy Loam	
Building Constraint Summary: 18% hydric soil / 29% high water table / 30% steep slope		

Gunston Cove, into which Accotink and Pohick Creeks discharge, is the subject of an extensive ecological study conducted for Fairfax County by Jones, et al. of George Mason University. In the course of 3 years, Jones, et al. (1987) found that physico-chemical water quality parameters in these waters followed a strong seasonal pattern, largely driven by responses of phytoplankton to seasonal changes in temperature and solar radiation. As water temperature increased each spring, chlorophyll and phytoplankton density increased, accompanied by increases in dissolved oxygen, pH, and alkalinity expected with increased photosynthesis. Total and volatile suspended solids increased, and secchi depths decreased in the warmer months, indicating that phytoplankton growth exhibits significant effects on water clarity in Gunston Cove. Summertime increases in alkalinity promote dissolution of phosphorus from sediments, and correlate with increased concentrations of soluble reactive phosphorus and total phosphorus; Jones, et al. (1987) note that in Gunston Cove, additions of phosphorus further increase phytoplankton growth to the point of bloom conditions.

Overall, water quality in Gunston Cove was only rated "fair" in a 1985 survey of the Potomac River, and waters from Gunston Cove have violated water quality standards for pH, dissolved oxygen, and fecal coliform concentrations (Metropolitan Washington Council of Governments, 1987). Jones, et al. (1987) associated discharge from the Fairfax County Lower Potomac Pollution Control Plant (LPPCP), which discharges into Pohick Creek, with added nutrients such as deionized ammonia to Gunston Cove. This may contribute to the problem of phytoplankton blooms in the Cove. Yet, increased discharges from Pohick and Accotink Creeks also help water quality by increasing flushing in Gunston Cove (Jones et al., 1986). Average summertime water quality conditions for Gunston Cove are summarized in Table 3-8.

In 1986 it was estimated that because of development, the stormwater runoff at the installation increased by about 2.7 times the runoff rate expected under completely natural, wooded conditions (U.S. Army Corps of Engineers, 1986). The installation contributes nearly 10,000 tons of silt annually to adjacent receiving waters (U.S. Army Corps of Engineers, 1986).

The Virginia Commission of Game and Inland Fisheries designates all free-flowing water within this area as Class III trout waters. Class III waters may contain a fair population of wild trout, however, their carrying capacity for trout is depressed by natural factors or man-related land use practices; Class III trout streams are considered to be in an active state of degradation or recovery from degradation (VR 680-21-08.2).

Table 3-8
WATER QUALITY RATINGS
AND AVERAGE SUMMER WATER QUALITY CONDITIONS FOR GUNSTON COVE

Parameter	Excellent	Good	Fair	Poor	Gunston Cove	Gunston Cove Rating
pH	6.9-8.0	8.1-8.4	8.5-9.5	>9.5	9.2	Fair
Dissolved Oxygen (mg/l)	8.0-9.5	6.0-7.9	4.0-5.9	<4.0	9.1	Excellent
Suspended Solids (mg/l)	<25	25-80	81-400	>400	39	Good
Total Organic Carbon (mg/l)	<5	5-20	21-35	>35	6.7	Good
Nitrate Nitrogen (mg/l)	<.20	.21-.60	.61-2.0	>2.0	1.74	Fair
Total Phosphorus (mg/l)	<.05	.05-.25	.26-.99	>1.0	0.16	Good
Chlorophyll-a (mg/l) freshwater	0-24	25-49	50-99	>=100	66	Fair
Fecal Coliform Bacteria	<200	201-500	501-1000	>1000	660	Fair

Sources: Water quality ratings from the Interstate Commission on the Potomac River Basin, 1979; and average summer water quality conditions from the Metropolitan Council of Governments, 1987

3.2.1.4.1 BRAC 1. An unnamed tributary of Accotink Creek forms the northern boundary of the preferred alternative for the Headquarters Complex. No water quality data is available for this stream. During the field surveys completed on this site in March and September 1990, the stream contained flowing water with an average depth of 4 to 6 inches. The stream also contains several pools along its length. The pools range in depth from 18 to 30 inches. The stream bottom is composed primarily of small- to medium-sized cobbles, except for the pools, which contain silt and sand. This stream also forms the southern boundary for Alternative 2.

Alternative 3 does not contain any surface water bodies.

3.2.1.4.2 BRAC 2. The preferred alternative does not contain any surface water bodies.

Alternative 2 is bisected by the headwaters area of an unnamed tributary of Accotink Creek. Site visits indicate that stream flow on the site is seasonal. No water quality data is available for this stream.

3.2.1.4.3 BRAC 3. The preferred alternative for BRAC 3, North, crosses the headwaters area of one unnamed tributary of Dogue Creek, four unnamed tributaries of Mason Run, and Mason Run. These streams are presently culverted under the existing unimproved dirt road. The flows of all of these streams except Mason Run and the Dogue Creek tributary, appear to be seasonal.

Alternative 2 crosses Mason Run and two of its unnamed tributaries in the same places as the preferred alternative.

The preferred alternative for BRAC 3, South, crosses the headwaters area of an unnamed tributary of Gunston Cove. The flow at the proposed stream crossing appears to be seasonal.

3.2.1.4.4 BRACs 4, 5, 6, 7, 8, 9, and 10. None of the alternatives for any of these BRAC projects is bounded by or contains surface water bodies.

3.2.1.5 Climate and Air Quality

Fort Belvoir lies within the transition zone between the northern and southern climate regimes on the east coast. As a result, winters in a normal year are not severely cold, with only occasional snowfall. The average temperature in the coldest month is 35°F; the lowest recorded temperature in 1989 was an atypical 5°F (NOAA, 1989). Summers are usually hot and humid, with the warmest temperatures occurring in July and August. The average temperature in the hottest month is 79°F; the highest temperature in 1989 was 96°F. The average annual rainfall is approximately 37 inches; thunderstorms are common in summer months. Winds are generally from the north in the fall, winter, and spring and from the south during the summer.

Table 3-9 shows the average monthly and annual temperatures, precipitation, wind speed, and prevailing wind directions recorded at Washington National Airport, which is the closest complete National Oceanic and Atmospheric Administration weather station to Fort Belvoir.

Fort Belvoir is located in Fairfax County, which along with Loudoun and Prince William Counties, make up the DAPC Region VII. Region VII is part of the National Capital Interstate AQCR. Air quality in Region VII and elsewhere in the state is monitored by the DAPC. Air-quality monitoring is performed routinely throughout the state for those pollutants specifically regulated by the state and the Federal Clean Air Act. These criteria pollutants include TSP and particulate matter less than 10 microns in diameter, SO_2, CO, ozone (O_3), non-methane hydrocarbons, and nitrogen dioxide (NO_2). To regulate emissions of these pollutants, the State of Virginia has adopted ambient air standards that are not to be violated.

Table 3-9
REGIONAL CLIMATE SUMMARY

Month	Average Temperature	Average Precipitation	Average Wind Speed	Prevailing Wind Direction
January	35	2.8	10	SW
February	37	2.6	12	NW
March	46	3.4	13	NE
April	57	2.9	11	W
May	66	3.5	11	SW
June	75	3.4	10	SW
July	79	3.9	8	SE
August	77	4.4	8	NW
September	71	3.2	10	NE
October	59	2.9	10	NW
November	49	2.8	12	SW
December	37	3.1	11	NW
Annual Average	**57**	**38.9[a]**	**11**	**SW**

[a]Total average annual precipitation
Source: NOAA Local Climatological Data, 1989

Ambient air quality is monitored by the DAPC at several locations within Region VII. Air quality throughout Region VII is generally considered good, except that the entire National Capital Interstate AQCR is designated nonattainment for O_3. In addition to ozone, EPA is proposing to designate Region VII as nonattainment for CO because of continuing violations recorded on the monitors in Washington, D.C. The DAPC has petitioned EPA not to use the regional concept for CO-nonattainment designations because, unlike ozone, CO emissions have a very short life span in the atmosphere and are generally recognized as a localized problem.

Emissions of particulates and gaseous material from the installation and other regional stationary and mobile sources are the primary contributors to local air quality conditions. The primary sources of air pollutants at Fort Belvoir are shown in Table 3-10. The installation is considered a significant regional air pollution source, because total emissions attributed to Fort Belvoir sources are greater than 100 tons per year. Approximately 6,000 tons of emissions per year were emitted in 1975. The installation has since reduced air pollutant emissions. Efforts over the last decade and which will

Table 3-10
TOTAL AIR POLLUTION CONTRIBUTION FROM FORT BELVOIR--TONS/YEAR

	Total Suspended Particulates	Sulfur Oxides	Carbon Monoxide	Hydrocarbons	Nitrogen Oxides
Central Boilers	36.2	236.1	6.3	4.7	125.1
Unit Boilers/Emergency Generators	82.7	331.9	16.0	11.9	289.9
Incinerators	0.4	0.1	0.6	0.1	0.2
Fuel Handling/Storage	-	-	-	101.5	-
Painting/Laundry	-	-	-	9.4	-
Automobiles Trucks	33.0	12.0	2,567.0	326.0	280.0
Military Vehicles					
Gasoline	2.7	2.2	556.6	484.0	27.4
Diesel	13.4	4.9	7.3	16.6	27.0
Aircraft	55.0	45.9	186.8	46.2	36.2
TOTAL	**223.4**	**633.1**	**3,340.6**	**1,000.4**	**785.8**

Source: Directorate of Facilities Engineering, 1982.

continue include the closing of small, inefficient boilers that were used in pre-World War II temporary buildings; encouraging reductions in vehicle use and use of newer vehicles with better air quality controls; promoting car pools; and restricting land clearing in training areas to minimize airborne particulates.

The Engelside monitoring station, which monitors all six regulated emissions, is located about three miles north of the Post on U.S. Route 1 and is operated by the Fairfax County Health Department, Air Pollution Control Division. This unit serves as an indicator of air quality at the installation, although the Engelside unit is considered to provide a poor representation of air quality conditions at Fort Belvoir because of the monitoring unit's proximity (about 82 feet) to U.S. Route 1. This likely biases results because of the poorer air quality that blankets the highway. The installation is inspected periodically by the Commonwealth of Virginia Air Pollution Control Division to evaluate compliance with state and federal standards. These inspections have revealed that Fort Belvoir is in compliance.

Because climate and air quality are regional issues and monitored on that basis, a site-specific discussion for each of the BRAC project alternatives is neither possible nor applicable.

3.2.2 BIOLOGICAL RESOURCES

3.2.2.1 Terrestrial Biota

3.2.2.1.1 Habitat. Fort Belvoir has a variety of natural habitat. The developed portions of the base (approximately 4,000 acres) are typical urban habitats: lawns, tree-lined streets, golf courses, parade grounds, and isolated parks. The remaining portion of the post is undeveloped acreage consisting primarily of wildlife refuges and training areas (Waas, 1983). Most of the undeveloped land is wooded, open field, or wetlands (Waas, 1983). Of this acreage, approximately 1,250 acres has been set aside into two wildlife refuges, Accotink Bay Wildlife Refuge and Jackson Miles Abbott Wetland Wildlife Refuge; approximately 3,243 acres are managed for commercial forest production; 55 acres are managed as wildlife food plots; and 100 acres are set aside for use by the Boy Scouts (Waas, 1983).

As Figure 3-3 shows, the undeveloped land at Fort Belvoir is divided into:

- 28 training areas (T-1 to T-17)
- Four floodplain fields (F-1 to F-4)
- Four areas designated as refuge: W-1 to W-3 comprise the Accotink Bay Wildlife Refuge and W-4 is the Jackson Miles Abbott Memorial Refuge
- Two parade grounds (P-1 and P2)
- One reserve area (R-1)

The habitat types located in most of these areas are shown in Table 3-11. Areas P-1, P-2, and R-1 were omitted from the table because they have little habitat value.

Environmental specialists in the Directorate of Engineering and Housing (DEH) manage the undeveloped acreage at Fort Belvoir. They monitor game populations, manage habitats, and control timber harvesting programs. The undeveloped lands are managed under the Fort Belvoir Natural Resources Management Plan (Waas, 1983).

3.2.2.1.1.1 BRAC 1. The preferred alternative for the Headquarters Complex has been heavily disturbed by past activities and has little overall habitat value. It does provide habitat for early successional wildlife and plant species, but there is an abundance of this habitat type scattered throughout the post.

Alternative 2 is composed of mature hardwood forest, wooded wetlands, rich woods, and open water habitats. The species diversity supported by this site is much higher than that supported by the preferred alternative.

Alternative 3 provides typical urban/disturbed habitat composed of mowed lawns and ornamental plantings.

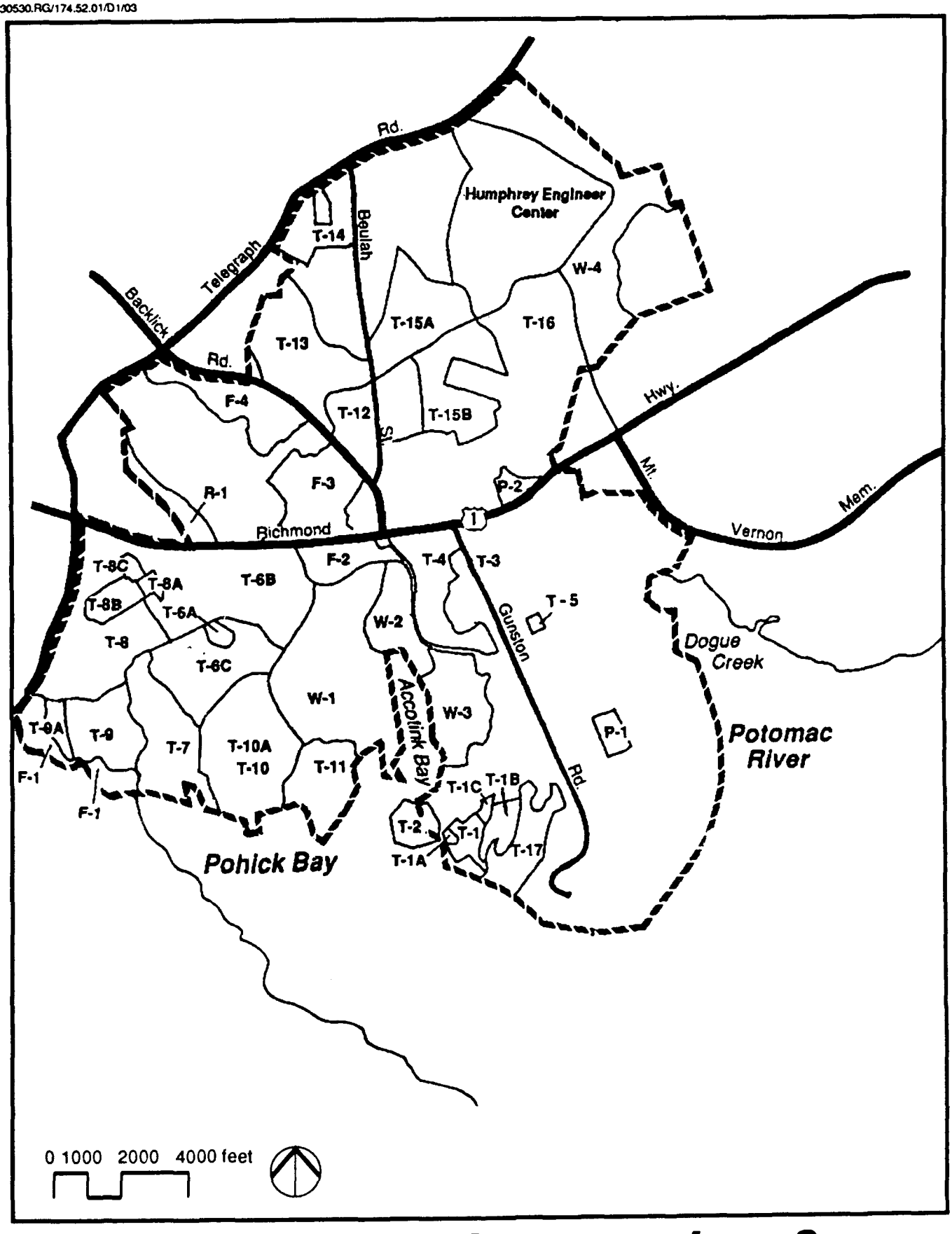


Figure 3-3
Fort Belvoir Training and Management Areas

Table 3-11
HABITAT TYPES FOUND IN DESIGNATED AREAS SURVEYED ON FORT BELVOIR

Area	River-banks	Wooded Wetlands	Uplands	Rich Woods[1]	Wet Meadows	Marshes & Swamps	Open Water	Urban/ Disturbed
T1		•	•				•	
T1A			•					•
T1B			•					•
T1C			•					•
T2	•							•
T3								•
T4		•	•				•	•
T5								•
T6A								•
T6B		•	•	•			•	•
T6C		•	•	•			•	•
T7	•	•	•	•	•	•	•	•
T8	•	•	•	•	•	•	•	•
T8A								•
T8B			•					•
T8C			•					•
T9		•	•	•		•	•	•
T9A		•		•	•	•		
T10	•	•	•		•	•	•	
T10A								•
T11	•	•	•			•	•	
T12			•					•
T13		•	•	•		•	•	
T14		•	•				•	•
T15A		•	•	•			•	•
T15B		•	•				•	•
T16		•	•	•		•	•	•
T17	•	•	•				•	•
F1	•	•		•	•	•	•	
F2	•	•		•	•	•	•	
F3	•	•		•	•	•	•	
F4	•	•		•	•	•	•	
R1			•					
W1	•	•	•	•	•	•	•	
W2	•	•	•	•	•	•	•	
W3	•	•	•	•	•	•	•	
W4	•	•	•	•	•	•	•	

[1]Transition zone between uplands and wooded wetlands that often provides critical habitat for rare, threatened, and endangered species.

3.2.2.1.1.2 BRAC 2. The preferred alternative for BRAC 2 provides herbaceous rangeland habitat. The area is currently part of the existing stables complex and much of it is overgrazed.

Alternative 2 is composed of typical edge habitat and mature hardwood forest. In addition, there is a small area of wooded wetland associated with the headwater area of the unnamed tributary of Accotink Creek that bisects the site.

3.2.2.1.1.3 BRAC 3. Both the preferred alternative and Alternative 2 for BRAC 3, North, are composed of mature hardwood forest, wooded wetlands, open water, and urban/disturbed areas. Alternative 2, however, is primarily urban/disturbed because it is a much shorter road.

The preferred alternative for BRAC 3, South, is routed through a heavily developed industrial area for most of its length. A small section of the road crosses a partially disturbed wooded area. The habitat quality of this wooded area is only fair because it is surrounded by development.

3.2.2.1.1.4 BRAC 8. The preferred alternative for this project is located in an area that has already been heavily developed. As a result, it provides little habitat for wildlife.

While portions of Alternative 2 are wooded, the plateau has become isolated from other wooded areas around it because of development. As a result, the number of species using the site is low.

3.2.2.1.1.5 BRACs 4, 5, 6, 7, 9, and 10. All of the alternatives for each of these projects have been heavily disturbed and provide little habitat for wildlife.

3.2.2.1.2 Wildlife Genetic Corridor. Fort Belvoir has been identified as a critical link in the genetic or "green" corridor that connects Huntley Meadows Park to Mason Neck National Wildlife Refuge (Figure 3-4). This is recognized as part of the contiguous genetic corridor by both Fairfax County and the U.S. Fish and Wildlife Service (Ernst, et al., 1990). Genetic corridors allow for the movement of species between larger patches of habitat, thus allowing species to survive in landscapes where they would not normally occur (Redford and Fonseca, 1986). At Fort Belvoir, several species, including the ovenbird (*Seiurus novebracensis*) and the barred owl (*Strix varia*), are dependent upon the corridor to sustain viable breeding populations because they require large tracts of land (7,500 acres) (Robbins, et al., 1989). Robbins, et al. (1989) concluded that reserves of at least 2,500 acres are necessary to provide adequate habitat for most forest-interior-dwelling birds, but that two smaller reserves, connected by a green corridor, may provide adequate habitat for many of these species as well. In this instance, Huntley Meadows and Mason Neck National Wildlife Refuge are major reserves, each of which contain both large and small forested tracts. Fort Belvoir contains the corridor that allows for movement of species between the two reserves. Fragmentation of this corridor will affect the ovenbird and barred owl.

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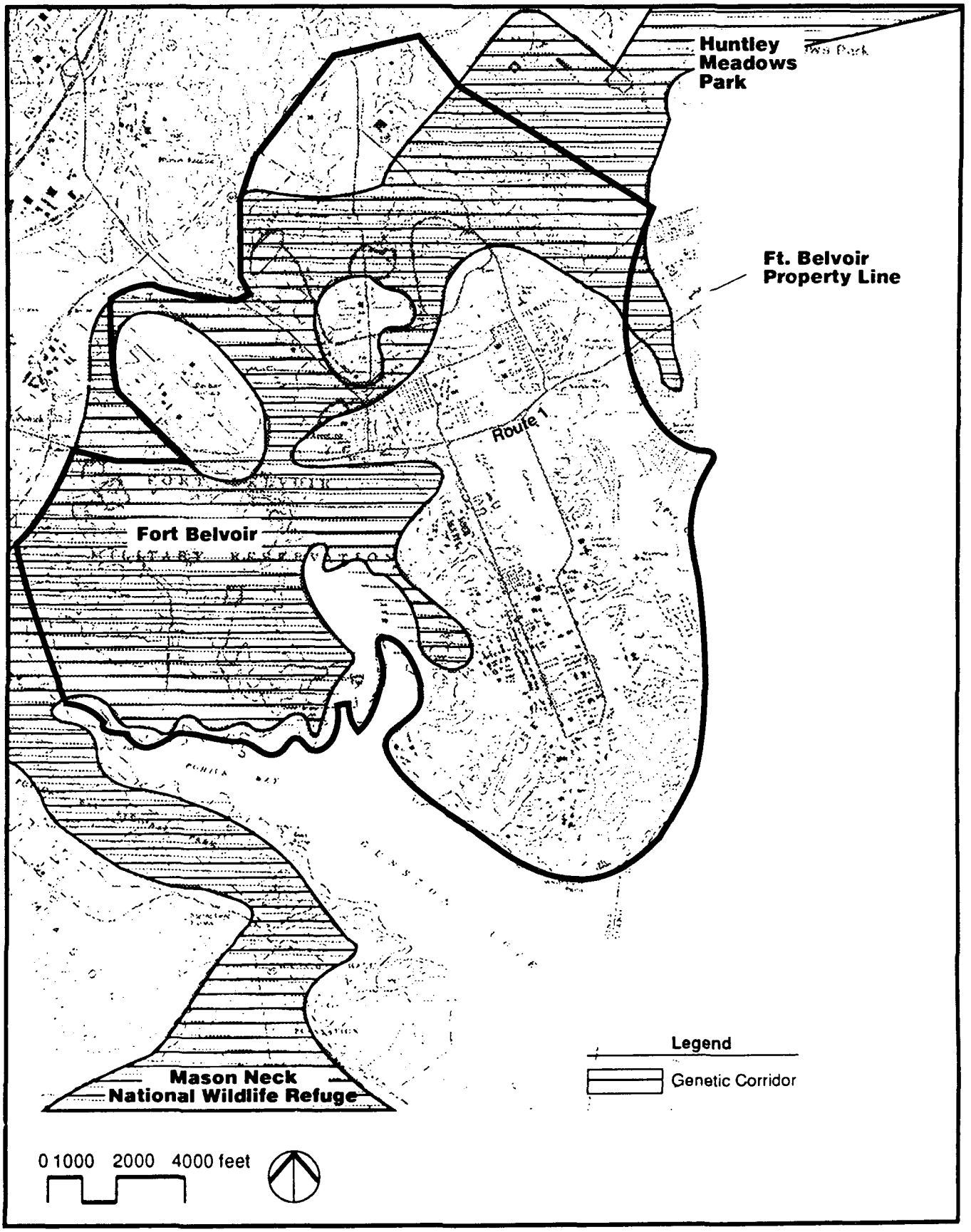


Figure 3-4
Genetic Corridor Alignment on Fort Belvoir

Corridors are especially critical in eastern woodlands (Ernst, et al., 1990), where habitat fragmentation caused by development has eliminated many large, contiguous forest tracts. The importance of wildlife corridors has been the subject of several studies in recent years. Johnson (1986) and MacClintock (1977) indicated that many species of birds breeding in the riparian zones surrounding wetlands have a low tolerance to deforestation. Johnson also concluded that a minimum 250-foot buffer is needed to minimize the effects of development on local breeding birds. Jones (1986) concluded that a minimum 330-foot buffer around riparian wetlands is necessary to maintain open corridors, facilitate wildlife movements, and prevent genetic isolation of populations.

Fort Belvoir has a large forested tract (Accotink Bay Wildlife Refuge), which during development will serve as a functioning genetic corridor for wildlife movement among the various tracts of land. On the basis of 2 years of biological field studies of this corridor, Ernst (personal communication, 1990) stated that the minimum width for a continuous strip of forested land must be 250 yards in order to remain a functional genetic corridor. He also stated that paved roads must have underpasses or culverts that are designed to encourage the free passage of wildlife. Fort Belvoir's development process will take into account these constraints and will monitor, for 2 years, all mitigation structures to ensure that they function as intended.

Genetic isolation occurs when populations of certain species are separated by a topographic, natural, or man-made barrier. While the isolation can, in rare instances, lead to speciation over a long period of time, it usually leads to inbreeding, overexploitation of food resources, and general weakening of stock.

The genetic corridor at Fort Belvoir has been mapped by installation personnel (see Figure 3-4).

3.2.2.1.2.1 BRAC 1. Both the preferred alternative and Alternative 2 are located within a critical constriction of the corridor (Figure 3-4). However, because Alternative 2 is wooded and contains a large stream valley, it is more valuable to wildlife as a migration route. The disturbed nature of the preferred alternative limits its value to wildlife because many species will not venture out into the open.

Alternative 3 is not within the corridor.

3.2.2.1.2.2 BRAC 2. The preferred alternative is not located within the corridor but Alternative 2 is. However, the location of Alternative 2 is not at or near a critical constriction.

3.2.2.1.2.3 BRAC 3. Both the preferred alternative and Alternative 2 for BRAC 3, North, are located in the northern portion of the corridor near a critical constriction at Backlick Road. The wooded area to the north of the proposed alignments has the highest value as a corridor because it is wooded and connected to other larger wooded areas to the north and east.

BRAC 3, South, is not within the corridor.

3.2.2.1.2.4 BRACs 4, 5, 6, 7, 8, 9, and 10. None of the alternatives for any of these projects is located within the wildlife corridor.

3.2.2.1.3 Vegetation. Several vegetation communities are associated with the undeveloped acreage on Fort Belvoir. Upland habitat is the most extensive community at Fort Belvoir. This habitat category can be further separated into deciduous uplands, pine uplands, and rangeland. Deciduous upland is, by far, the most prevalent vegetative cover type at Fort Belvoir. The three largest contiguous tracts of this habitat are located in:

- An area comprising T-13, T-15, T-15A, and T-16, north of Backlick Road and T-6 through T-11
- A second area including W-1 through W-4; F-2; and T-4, south of Richmond Highway and west of Gunston Road
- A third area, HEC, located adjacent to the extreme northeast corner of Fort Belvoir

The most frequently encountered species in these areas, as indicated by a field survey completed in March 1990, are: northern red oak (*Quercus rubra*), white oak (*Quercus alba*), American beech (*Fagus grandifolia*), chestnut oak (*Quercus prinus*), pitch pine (*Pinus rigida*), Virginia pine (*Pinus virginiana*), flowering dogwood (*Cornus florida*), highbush blueberry (*Vaccinium corymbosum*), fox grape (*Vitis labrusca*), poison ivy (*Toxicodendron radicans*), greenbriar (*Smilax rotundifolia*), Japanese honeysuckle (*Lonicera japonica*), ground pine (*Lycopodium obscurum*) and partridgeberry (*Mitchella repens*) (see Appendix B for further information). These upland forests range in age from about 10 years to 40+ years old.

The pine upland habitat at Fort Belvoir is restricted primarily to several pine plantations, totalling 500 acres, which are scattered throughout the post. Approximately 40 acres are planted annually, primarily on reclaimed landfills, gravel pits, and training areas (Waas, 1985). The primary species planted is loblolly pine (*Pinus taeda*), with Virginia pine planted only on areas having poor soils.

Herbaceous rangeland on Fort Belvoir is restricted to areas that were previously disturbed and are in the early stages of succession, and some areas that are used for heavy equipment and demolition training. Lawns and grassy areas around buildings and other structures are kept mowed so that little opportunity exists for them to revert to typical rangeland habitat.

The species most abundant in these areas of Fort Belvoir include orchard grass (*Dactylis glomerata*), barnyard grass (*Echinochloa crus-galli*), sweet vernal grass (*Anthoxanthum odoratum*), and panic grass (*Panicum* spp).

Fort Belvoir has an active forest management program composed of limited commercial harvesting, firewood sales, and replanting of clear-cut areas. The program is managed by the agronomist within DEH. The training areas of Fort Belvoir are divided into 22 forest management compartments. Major timbering operations occur every 2 to 3 years under this rotation. Decisions regarding the area to be cut are based on the age and stability of the stand, size of the surrounding canopy, distance to other open areas, slope, soil type, and distance to a watercourse. Timbering operations include thinning and clear-cutting and are usually completed by outside contract under the supervision of the installation agronomist. Clear-cutting is usually reserved for pine stands, while the mature deciduous stands are selectively cut to remove overmature trees.

Fort Belvoir initiated a land reclamation program in the late 1970s to revegetate many disturbed training areas, closed landfills, and gravel pits. This program has resulted in the creation of approximately 175 acres of new habitat and approximately 20 acres of food plots.

3.2.2.1.3.1. BRAC 1. The preferred alternative for the Headquarters Complex has been heavily disturbed by past activities and has little remaining native vegetation. The vegetative cover on this site is composed primarily of Virginia pine and panic grasses.

Alternative 2 is covered with hardwood forest. The dominant species are red maple, tulip poplar, American beech, northern red oak, white oak, highbush and lowbush blueberry, greenbriar, and poison ivy.

The buildings proposed for renovation for Alternative 3 are surrounded by lawns landscaped with ornamental shrubs.

3.2.2.1.3.2 BRAC 2. The preferred alternative for BRAC 2 is currently pasture for the stables at Fort Belvoir. It contains numerous grass species and a few large trees. Much of the field has been overgrazed.

Alternative 2 tor BRAC 2 contains the same species composition as Alternative 2, BRAC 1.

3.2.2.1.3.3 BRAC 3. The rights-of-way for both the preferred alternative and Alternative 2 for BRAC 3, North, contain the same species composition as Alternative 2, BRAC 1.

The preferred alternative right-of-way for BRAC 3, South, is covered with asphalt and concrete for two-thirds of its length. The remaining third is successional forest dominated by black locust (***Robinia pseudo-acacia***) and princess trees (***Paulowina tomentosa***).

3.2.2.1.3.4 BRAC 8. The preferred alternative for this project is located in an area that has already been heavily developed. Like Alternative 3, BRAC 1, it contains landscaped lawn.

The wooded portions of alternative 2 contain many of the species found at Alternative 2, BRAC 1. In addition, there are a few Virginia pines scattered throughout the site.

3.2.2.1.3.5 BRACs 4, 5, 6, 7, 9, and 10. All of the alternatives for each of these projects have been heavily disturbed and contain the same species as Alternative 2, BRAC 1.

3.2.2.1.4 Wildlife. The extensive forest and vegetative diversity at Fort Belvoir supports a wide variety of wildlife. Appendix C presents a list of wildlife species occurring or likely to occur at Fort Belvoir. The forests of Fort Belvoir have been the subject of several studies by the students and faculty of George Mason University. Surveys have been conducted for small mammals, birds, and raptor nests.

Alternative 2 for BRACs, 1, 2, and 8 contain the habitat of greatest value, and therefore, the greatest wildlife diversity of all of the BRAC sites. The disturbed and urban nature of the remaining sites limit their value to most wildlife species.

3.2.2.1.5 Game Species. Whitetail deer is the only game species hunted at the post. In general, they require mixed hardwood forest, with areas of different age classes, and water within one mile (Short, 1986). They also require areas of dense understory with browse lanes or open forage areas nearby or interspersed throughout the forest (Short, 1986). The installation manages deer by maintaining mixed-age forest plots through thinning and clear-cutting, cutting and maintaining browse lanes and forage plots, and population control through seasonal bow hunting.

3.2.2.2 Wetlands

Except for a few ponds, all of the wetlands on Fort Belvoir are associated with Dogue Creek, Accotink Creek, Pohick Creek, and the Potomac River (including Gunston Cove, Accotink Bay, and Pohick Bay). While a complete wetland delineation has not yet been completed for Fort Belvoir, examination of U.S. Fish and Wildlife Service National Wetland Inventory maps site-specific surveys (AMC, HEC, and Tompkins Basin), and the soil survey for Fort Belvoir (USDA, 1982) indicate that approximately one-quarter of the undeveloped acreage on the post is likely to be wetlands. The wetlands delineations will be completed before projects are sited to ensure that construction constraints are identified. The hydric soils associated with these wetlands are Fallsington, Lenoir, Wehadkee, Tidal Marsh, and Alluvial. Additional areas of soils with seasonally high water tables ($\leq$2 feet) that could exhibit hydric properties comprise almost another quarter of the currently undeveloped acreage. These soils include Beltsville, Bertie, Chewlaca, Dragston, Keyport, Mattapex and Woodstown.

There are three predominant wetland types at Fort Belvoir: Wooded wetlands (palustrine forested), wet meadows (palustrine emergent/scrub-shrub), and marshes and swamps (emergent and palustrine emergent). The largest continuous tracts of wetlands are classified as palustrine emergent/scrub-shrub wetlands. These areas occur at the mouths of all three creeks and intermittently along their lengths. In addition, another large complex along Dogue Creek is within the HEC area and extends south into the

Jackson Miles Abbott Wetland Wildlife Refuge (W-4). The remaining areas are palustrine forested wetlands.

Fort Belvoir's wetlands encompass a wide range of water regimes and salinities. The wetlands at the mouths of each of the creeks are classified as brackish-water, tidal wetlands. These wetlands, especially upstream along Accotink, Pohick, and Dogue Creeks, become freshwater tidal wetlands and finally nontidal wetlands.

The variety of salinities and tidal regimes support a diverse array of vegetation. The predominant vegetation in the nontidal wetland areas includes red maple (*Acer rubrum*), black gum (*Nyssa sylvatica*), sweet gum (*Liquidambar styraciflua*), highbush blueberry (*Vaccinium corymbosum*), lowbush blueberry (*Vaccinium angustifolium*), ironwood (*Carpinus caroliniana*), tulip poplar (*Liriodendron tulipifera*), pin oak (*Quercus palustris*), willow oak (*Quercus phellos*), American sycamore (*Plantanus occidentalis*), northern arrowwood (*Viburnum recognitum*), sweetbay magnolia (*Magnolia virginiana*), New York fern (*Dryopteris noveboracensis*), lady fern (*Athyrium filix-foemina*), cinnamon fern (*Osmunda cinnamomea*), ostrich fern (*Matteucia struthiopteris*), sensitive fern (*Onoclea sensibilis*), wood fern (*Dryopteris marginalis*), and greenbriar (*Smilax rotundifolia*).

The freshwater tidal wetlands support similar vegetative types within their floodplains. They also support, in some areas, a few aquatic emergent species including soft rush (*Juncus effusus*), Canada rush (*Juncus canadensis*), broad-leaved cattail (*Typa latifolia*), wild rice (*Zizania aquatica*), pickerel weed (*Pontederia cordata*), and arrow arum (*Peltandra virginica*).

The brackish tidal wetlands on Fort Belvoir are confined to the lower reaches of the Pohick, Accotink, and Dogue Creeks. The largest of these wetlands is located in Accotink Bay within the boundaries of the Accotink Bay Wildlife Refuge (areas W-1, W-2, and W-3). Plant species in these areas are similar to those found in the tidal freshwater wetlands.

3.2.2.2.1 BRAC 1. A preliminary survey indicates that there are palustrine forested wetlands associated with the stream on the northern boundary of this site.

The wetland area described above also forms the southern boundary of Alternative 2.

Alternative 3, which involves building renovations, does not contain wetlands.

3.2.2.2.2 BRAC 2. A preliminary survey indicates that there are no wetlands on this site.

Alternative 2 contains an ephemeral stream-headwater area in the center of the site. A preliminary survey indicates that there are palustrine forested wetlands associated with this stream.

3.2.2.2.3 BRAC 3. A jurisdictional wetland delineation has been completed for both the preferred alternative and Alternative 2 for BRAC 3, North. There are palustrine forested and scrub/shrub emergent wetlands associated with the six streams crossed by the preferred alternative, as well as the three crossed by Alternative 2.

A jurisdictional wetland delineation has also been completed for the preferred alternative for BRAC 3, South. The right-of-way crosses an ephemeral stream that contains a narrow band of palustrine forested wetlands.

3.2.2.2.4 BRACs 4, 5, 6, 7, 8, 9, and 10. Except for Alternative 2, BRAC 8, none of the other alternatives for any of the BRAC projects were found to contain wetlands during preliminary field surveys.

Alternative 2, BRAC 8, is bordered by wetlands on the west, south, and east sides. As a result, the buildable area on this site is restricted to elevations above 125 feet MSL.

3.2.2.3 Aquatic Biota

The Gunston Cove Study being conducted by George Mason University for Fairfax County has documented numerous fish species within the cove, as well as within Accotink and Pohick Bays and Dogue Creek. Ichthyoplankton are sampled annually from March through August with populations peaking in mid-May. The peak is attributable primarily to hatching of herring and shad (Jones, et al., 1987). Table 3-12 lists the species caught during the ichthyoplankton surveys in 1986.

Table 3-12
ICHTHYOPLANKTON SPECIES, GUNSTON COVE

Scientific Name	Common Name
Dorosoma cepedianum	gizzard shad
Alosa spp.	blueback herring & alewife
Morone americana	white perch
Morone saxatilis	striped bass
Menidia beryllina	inland silverside
Lepomis spp.	sunfish spp.
Lepomis macrochirus	bluegill
Notropis hudsonius	spottail shiner
Cyprinus carpio	carp
Perca flavescens	yellow perch
Carpiodes cyprinus	quillback

Source: Jones, et al., 1987.

Sampling by trawl and seine for juvenile and adult fish is conducted monthly throughout the year. Fish caught during the trawl sampling showed an overall abundance peak from June to September. Blueback herring and alewife peaked early during this period and Atlantic menhaden and gizzard shad tended to be more common in the late summer and early fall. Bay anchovy and spot were also most common later in the sampling period (Jones, et al., 1987).

Fish caught during the seine sampling were primarily white perch, banded killifish, inland silverside, and spottail shiner. White perch and inland silversides were caught from April through October, with numbers peaking in August. Banded killifish populations peaked in January, June and August. Spottail shiner had an erratic distribution, peaking in April and September (Jones, et al., 1987). Table 3-13 lists the species caught during the trawl and seine sampling.

Benthic invertebrates were sampled in August 1986 as part of the Gunston Cove Study. The greatest diversity of benthic invertebrates encountered was in the outer cove and Potomac River areas. Table 3-14 lists the invertebrates identified during the sampling period.

Four species of submerged aquatic vegetation were found during the 1986 Gunston Cove Study: hydrilla (*Hydrilla verticillata*), Eurasian watermilfoil (*Myriophyllum spicatum*), water celery (*Valisneria americana*), and coontail (*Ceratophyllum demersum*). The most dominant species were hydrilla and Eurasian watermilfoil. In addition to these plants, spatterdock (*Nuphar luteum*) was common in all of the shallow upper reaches of Accotink and Pohick Bays, as well as in Dogue Creek.

In addition to the Gunston Cove Study, George Mason University has sampled some of the upstream areas of the Accotink, Pohick, and Dogue Creeks as part of the Ecological Resource Inventory Committee studies being conducted for Fairfax County. A list of species caught, by sampling station location, is presented in Table 3-15.

No formal sampling for aquatic biota was conducted at any of the BRAC project alternatives. Preliminary field surveys located several species of frogs (wood, green, bull, spring peepers, and grey tree frogs) as well as a few small fish in the streams at both the preferred alternative and Alternative 2 for BRAC 1 and Alternative 2, BRAC 8.

3.2.2.4 Threatened and Endangered Species

In compliance with Section 102 (42 U.S.C. 4332) and Section 7 of the Endangered Species Act of 1973 (16 U.S.C. 1531), a BATES was prepared for Fort Belvoir, Fort Myer, and Cameron Station in March 1990 (see Appendix B). The survey confirmed the presence of a nesting pair of bald eagles (*Haliaeetus leucocephalus*), a federal- and state-listed endangered species. The small mammal survey being conducted by George Mason University also confirmed the presence of the pygmy shrew (*Sorex hoyi winnemana*), a federal candidate species (see letter from Biota of Virginia in Appendix B).

Table 3-13
COMPOSITION OF FISH SPECIES CAUGHT BY TRAWLING AND SEINING, GUNSTON COVE

Scientific Name	Common Name
Anguilla rostrata	American eel
Alosa aestivalis	blueback herring
Alosa pseudoharengus	alewife
Brevortia tyrannus	Atlantic menhaden
Dorosoma cepedianum	gizzard shad
Anchoa mitchilli	bay anchovie
Hybognathus regius	eastern silvery minnow
*Notemigonous crysoleucas**	golden shiner
Notropis hudsonius	spottail shiner
Catostomus commersoni	white sucker
*Moxostoma macrolepidotum**	northern redhorse
Ictalurus nebulosus	brown bullhead
Ictalurus punctatus	channel catfish
Fundulus diaphanus	banded killifish
*Fundulus heteroclitis**	mummichog
*Menidia beryllina**	Inland silverside
Morone americana	white perch
Morone saxatilis	striped bass
Lepomis gibbosus	pumpkinseed
Lepomis macrochirus	bluegill
Etheostoma olmstedi	tessellated darter
Perca flavescens	yellow perch
Leiostomus xanthurus	spot
Trinectes maculatus	hogchoker
*Micropterus salmoides**	largemouth bass

* - species caught in seines only
Source: Jones, et al., 1987.

WDCR504/022.51

Table 3-14
BENTHIC INVERTEBRATE SPECIES, GUNSTON COVE

Scientific Name	Common Name
Hirudinea	leeches
Oligochaeta	worms
Polychaeta	marine worms
Arachnida	mites
Chrinomidae	midges
Chaoboridae	phantom midges
Trichoptera	caddisflies
Gammarus	amphipods
Leptocheirus	tubicolus amphipods
Cyanthura	amphipod crustaceans
Corbicula	bivalve molluscs
Anodonta	bivalve molluscs
Musculium	bivalve molluscs
Pisidium	bivalve molluscs
Gastropoda	snails

Source: Jones et al., 1987

WDCR504/023.51

Table 3-15
FISH SPECIES COLLECTED FROM FOUR SITES WITHIN THE FORT BELVOIR REGION

Scientific Name	Common Name	Dogue Cr. (Mt. Vernon Ave)	Long Branch (Backlick Rd)	Dogue Cr. (Kingman Rd)	Accotink Cr. (Telegraph Rd)
Anguilla rostrata	American eel	*	*	*	*
Catastomus commersoni	white sucker	*	*		
Clinostomus funduloides	dace species		*		
Cyprinus carpio	carp	*			
Esox niger	chain pickerel			*	
Erimyzon oblongus	creek chubsucker	*	*	*	
Etheostoma flabellare	fantail darter		*		
Etheostoma olmstedi	tesselated darter	*		*	*
Fundulus diaphanus	banded killifish	*		*	*
Hypentelium nigricans	northern hogsucker	*			*
Ictalurus natalis	yellow bullhead			*	
Lepomis auritus	redbrest sunfish		*		*
Lepomis cyanellus	green sunfish	*	*		
Lepomis gibbosus	pumpkinseed	*	*	*	
Lepomis macrochirus	bluegill	*	*	*	
Lepomis megalotis	longear sunfish	*	*		
Micropterus dolomieui	smallmouth bass		*		
Micropterus salmoides	largemouth bass	*		*	
Nocomis micropogon	river chub		*		*
Notemigorous crysoleucas	golden shiner				*
Notropis analostanus	satinfin shiner				*
Notropis cornutus	common shiner			*	*
Notropis procne	swallowtail shiner		*		*
Osmerus sp.	unknown	*			
Perca flavescens	yellow perch	*			
Rhinichthys atratulus	blacknose dace		*		*
Rhinichthys cataractae	longnose dace		*		*
Semotilus atromaculatus	creek chub		*		
Umbra sp.	mudminnow			*	

Source: Zylstra and Kelso, in prep.

In addition to the federal- and state-listed endangered species, several "species of concern" to the Virginia Natural Heritage Program have been located at Fort Belvoir. These species, while not formally listed on the state threatened and endangered species list, are considered rare in the state, and as such are monitored by the program (Table 3-16).

Appendix D lists the species for which suitable habitat was located during the March 1990 BATES survey; however, because of the timing of the survey not all of the potential species could be located. Therefore, areas with habitat suitable for a rare, threatened, or endangered species need additional surveying to determine if any such species occur at Fort Belvoir. If candidate species are located at Fort Belvoir, the Army will treat these species as if they were listed. Although extensive resource inventories have been completed, in order to include BRAC sites, an intensive field monitoring study of the wood turtle remains to be done. This study will be performed so that effective mitigation can be developed for the BRAC 3 alignment and design.

3.2.3 SOCIOECONOMIC CONDITIONS

Most of the conditions discussed below are independent of siting. As a result, only those conditions that have site-specific components will contain discussions for the appropriate BRAC alternatives.

3.2.3.1 Land Use

Fort Belvoir is currently being used by the military, both active and reserve; outside tenant organizations; and local, state, and federal governments. Land use at the installation can be divided into 10 categories as shown in Table 3-17.

Fort Belvoir accounts for a large share of the developed land in Fairfax County's Lower Potomac Planning District. With the inclusion of the parklands in the Mason Neck sector (LP-3), approximately 55 percent of the total area in the district is used for institutional purposes. Residential areas account for approximately 12 percent of the district and undeveloped land is 20 percent; about 25 percent of this undeveloped land is committed for development under the County's Comprehensive Plan.

Except for Alternative 2, BRAC 2, all of the alternatives for all of the BRAC projects are currently sited in areas with a compatible land use designation. Alternative 2, BRAC 2, is sited in an area designated for training. Locating the Industrial Park at this location will require additional environmental review for nonconforming use.

3.2.3.2 Population

3.2.3.2.1 Fairfax County. Fort Belvoir is located in Fairfax County, Virginia. Population increases in Fairfax County have exceeded those of the Washington, D.C., MSA (Table 3-18).

Table 3-16
RARE, THREATENED, AND ENDANGERED ANIMAL SPECIES CONFIRMED AT FORT BELVOIR

Scientific Name	Common Name	State Rank	Federal Status	State Status
Haliaeetus leucocephalis	bald eagle	LE	LE	LE
Sorex hoyi winnemanna	pygmy shrew	SU	C	
Fulica americana	American coot	S1		
Phalocrocorax auritus	double-crested cormorant	S1		
Butorideas striatus	green-backed heron	S1		
Ixobrychus exilis	least bittern	S2		RSU
Carpodactus purpureus	purple finch	S1/S2		
Gallinula chloropus	common moorhen	S1/S2		RSU
Sterna forsteri	Forster's tern	S2		
Dendroica magnolia	magnolia warbler	S2		RSU
Clemmys insculpta	wood turtle	S2/S3		RT
Rallus elegans	king rail	S2/S3		RSU
Riparia riparia	bank swallow	S3		
Melanerpes erythrocephalus	red-headed woodpecker	S3		
Blarina carolinensis	southern short-tailed shrew	S3		

Key:

LE - listed endangered
C - candidate species
S1 - critically imperiled in Virginia, often especially vulnerable to extirpation
S2 - imperiled in Virginia, susceptible to becoming endangered
S3 - rare-to-uncommon, may be susceptible to large-scale disturbances
SU - status uncertain either because of low search effort or cryptic nature of species
RT - recommended threatened
RSU - recommended status undetermined

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Table 3-17
SUMMARY OF LAND USE CATEGORIES, FORT BELVOIR, 1989

Function on Post	Acres	Percent
Administration	404	4.6
Research	1,342	15.5
Medical	26	0.3
Community Facilities	495	5.7
Housing	1,285	14.8
Service and Storage	768	8.8
Recreation (includes wildlife refuge*)	1,128	13.0
Environmentally Sensitive Areas*	225	3.0
Transportation	631	7.3
Training	2,352	27.0
Totals	**8,656**	**100.0**

*Also includes floodplain.
Source: Annual Utilization of Real Estate, March 31, 1989. Facility Planning Division, DEH, U.S. Army Ft. Belvoir.

Table 3-18
POPULATION TRENDS IN FAIRFAX COUNTY, 1983-1988

Year	Fairfax County Population	Average Annual Change (Percent)	
		Fairfax County	Washington, D.C., MSA
1983	639,900	-0-	-0-
1984	658,800	3.0	1.4
1985	668,300	1.4	1.4
1986	683,800	2.3	1.8
1987	704,800	3.1	3.0
1988	746,600	5.9	3.7

Source: Metropolitan Washington Council of Governments, 1989. Local government estimates and the Bureau of the Census figures.

3.2.3.2.2 Fort Belvoir. The current post population of Fort Belvoir is approximately 8,760 civilian employees; 7,340 military employees; and 5,400 family members. This represents approximately 2.4 percent of the Fairfax County population on the basis of 1988 population data.

3.2.3.3 Housing

3.2.3.3.1 Fairfax County. Fairfax County had the greatest number of residential building permits issued in the region during the period from 1983 through 1988. More than 70,000 residential building permits were issued during this period (Table 3-19). Of the 70,000 building permits issued, 75.9 percent were for single-family dwelling units.

Table 3-19
HOUSING TRENDS IN FAIRFAX COUNTY, 1983-1988

	Total Residential Units Constructed	Single-Family Units Constructed	Percent Single Family	Percent of Total Region
Fairfax County	70,523	53,560	75.9	31.6
Washington, D.C., MSA	223,446	170,749	76.4	100

Source: Metropolitan Washington Council of Governments, 1989. Permit-Authorized Construction in Selected Permit-Issuing Places. U.S. Department of Commerce, Bureau Of the Census, C-40 Reports.

3.2.3.3.2 Fort Belvoir. Fort Belvoir has 2,099 family housing units. These would equate to approximately .30 percent of the total residences constructed in Fairfax County on the basis of 1988 data.

3.2.3.4 Employment

3.2.3.4.1 Fairfax County. Fairfax County's share of the total number of jobs in the metropolitan region grew from 3.4 percent in 1983 to 3.8 percent in 1988 (Table 3-20). The number of jobs in Fairfax County grew from approximately 227,900 in 1983 to approximately 345,200 in 1988 for a total increase of 51.5 percent during this period.

3.2.3.4.2 Fort Belvoir. Fort Belvoir currently employs approximately 7,340 military and 8,760 civilian personnel, which represents approximately 4.4 percent of Fairfax County's employment on the basis of 1988 data.

Table 3-20
EMPLOYMENT TRENDS IN FAIRFAX COUNTY, 1983-1988

	Non-Agricultural Wage and Salary Jobs (Thousands)						
	1983	**1984**	**1985**	**1986**	**1987**	**1988**	**Percent Change (83-88)**
Fairfax County	227.9	254.0	281.9	301.7	321.8	345.2	51.5
Percent of Total Employment in Washington. D.C., MSA		13.7	14.4	15.1	15.5	15.8	16.3

Source: Metropolitan Washington Council of Governments, 1989. Compiled by MWCOG, from the District of Columbia Department of Employment Services, Maryland Department of Economic and Employment Development, and Virginia Employment Commission Reports.

3.2.3.5 Income

3.2.3.5.1 Fairfax County. In 1983, Fairfax County had the fourth highest per capita income in the region (Table 3-21). Fairfax County maintained this ranking during the years from 1983 to 1987. Virginia suburban jurisdictions have collectively been above the regional per capita income average, while the collective Maryland suburban jurisdictions have been below the regional average.

Table 3-21
ANNUAL PER CAPITA INCOME IN FAIRFAX COUNTY, 1983-1987

	1983	**1984**	**1985**	**1986**	**1987**
Fairfax County*	$18,330	$19,961	$21,692	$23,136	$24,839
Washington, D.C., MSA	$16,109	$17,519	$18,935	$20,148	$21,539

*Fairfax County numbers include the Cities of Fairfax and Falls Church.
Source: Metropolitan Washington Council of Governments, 1989. U.S. Department of Economic Analysis Regional Economic Analysis, Regional Economic Information System.

3.2.3.5.2 Fort Belvoir. The average annual income in 1989 for military employees at Fort Belvoir was $31,162 and for civilian employees $44,773.

3.2.3.6 Community and Army Facilities

The region around Fort Belvoir includes five elementary schools, (three of which are located on Fort Belvoir and operated by Fairfax County), one intermediate school, and two high schools.

Community fire protection is provided by the Gunston and the Lorton Fire Stations. Community police protection is provided by the Franconia District Station and the Mount Vernon District Station. Police and fire protection for facilities on Fort Belvoir are provided on post by the Army. The Fort Belvoir Fire Department has stations on the North Post and the South Post.

The area around the installation includes parkland and a network of open spaces as well as community parks. Public parks and recreational facilities in the area include Mason Neck State Park, Pohick Bay Regional Park, Potomac Shoreline Regional Park, Lee District Park, Accotink Park, and Huntley Meadows Park. Several historic resources are located throughout the area, including Pohick Church, Woodlawn Plantation, Gunston Hall, and Mount Vernon.

Regional shopping facilities (e.g., Springfield Mall) and several smaller shopping centers are located nearby, especially along Richmond Highway. In addition, laundry, shopping, child care, recreational, and religious facilities are available at Fort Belvoir for military personnel. DeWitt Army Hospital is located on Fort Belvoir's South Post. The Non-Commissioned Officer (NCO) Mess is open to civilian employees, and there is a cafeteria on the HEC site.

Electric power is provided to Fort Belvoir by Virginia Power under a peak demand agreement for 26.5 megavolt amps.

The FCWA supplies potable water to Fort Belvoir. Fort Belvoir's agreement for maximum demand with FCWA is 4.4 million gallons per day (mgd), which was increased in January 1989 from a previous 3.4 mgd. For comparison, the greatest daily demand in 1989 (September) was 1.96 mgd. Average demand per person is 146 gallons per day (gpd).

Wastewater generated at Fort Belvoir is collected and routed to Fairfax County's LPPCP for treatment. The installation's current agreement with the LPPCP allows for a maximum daily average per quarter of 3 mgd. The post generates, on average, 1.5 mgd. Domestic wastewater is generated at an average of 67 gpd per person.

Nonhazardous solid waste generated on the installation is collected by a private contractor employed by Fort Belvoir. The material is taken to the installation's Cullum Woods Sanitary Landfill. Currently, Fort Belvoir generates an estimated 42 tons per day of solid waste, an average of 3.8 pounds per person per day (based on a post-wide population of approximately 21,500 persons).

The existing Cullum Woods Sanitary Landfill, opened in 1978, is permitted by Virginia and accepts all of the municipal solid waste generated at Fort Belvoir. The landfill is, however, near closure and Fort Belvoir has identified several options for handling solid wastes in the future, including building either a new landfill or incinerator on the post, or joining the regional solid waste disposal system. The preferred alternative would be to join the regional solid waste disposal system in Fairfax County. The post is currently negotiating this option with the county.

Debris waste generated at the installation would be kept on the post and disposed at the existing Thoete Road Debris Landfill. Once the installation receives a permit from the Virginia Department of Waste Management for a landfill expansion, debris waste would be disposed at the proposed Cullum Woods Sanitary Landfill expansion.

The post has an active recycling program for cardboard, newspaper, and a variety of whitepaper. It is managed by the Environmental and Natural Resources Division of the Fort Belvoir DEH. Building 1089, located on Pohick Road near Gunston Road, serves as the center for storage and transfer of incoming and outgoing materials. DEH is also managing the expanded recycling program, which involves weekly curbside pickup of newspaper, glass, and metal cans. DEH expects to have most of the personnel on post participating in the program in the near future.

3.2.3.7 Traffic and Transportation

3.2.3.7.1 Regional and Subregional. A detailed transportation analysis was conducted in two parts: the first part addressed regional and subregional traffic impacts and the second focused on transportation impacts within Fort Belvoir. Both studies included the following baseline information and assumptions in the analysis.

3.2.3.7.1.1 Study Area. The regional study area was bounded by the Potomac River on the east, Little River Turnpike/Duke Street (Rt. 236) on the north, Route 123 on the west, and the Occoquan River on the south (Figure 3-5). This area is within the boundaries of Fairfax County and the City of Alexandria, Virginia, and contains portions of Shirley Highway (I-95 and I-395), the Capital Beltway (I-95 and I-495), Richmond Highway (US 1) and Duke Street (Rt. 236). The subregional area includes Fort Belvoir, EPG, and Cameron Station; the major subregional roadways are shown in Figures 3-6, 3-7 and 3-8, respectively.

3.2.3.7.1.2 Traffic Volume. Traffic volume data were compiled from various sources, including the Virginia Department of Transportation (VDOT), Fairfax County, and the City of Alexandria. The vehicles per day on the freeways range between 117,000 to 200,000 on Shirley Highway and between 140,000 and 183,000 on the Capital Beltway. Richmond Highway traffic volume ranges between 29,000 and 56,000 vehicles daily.

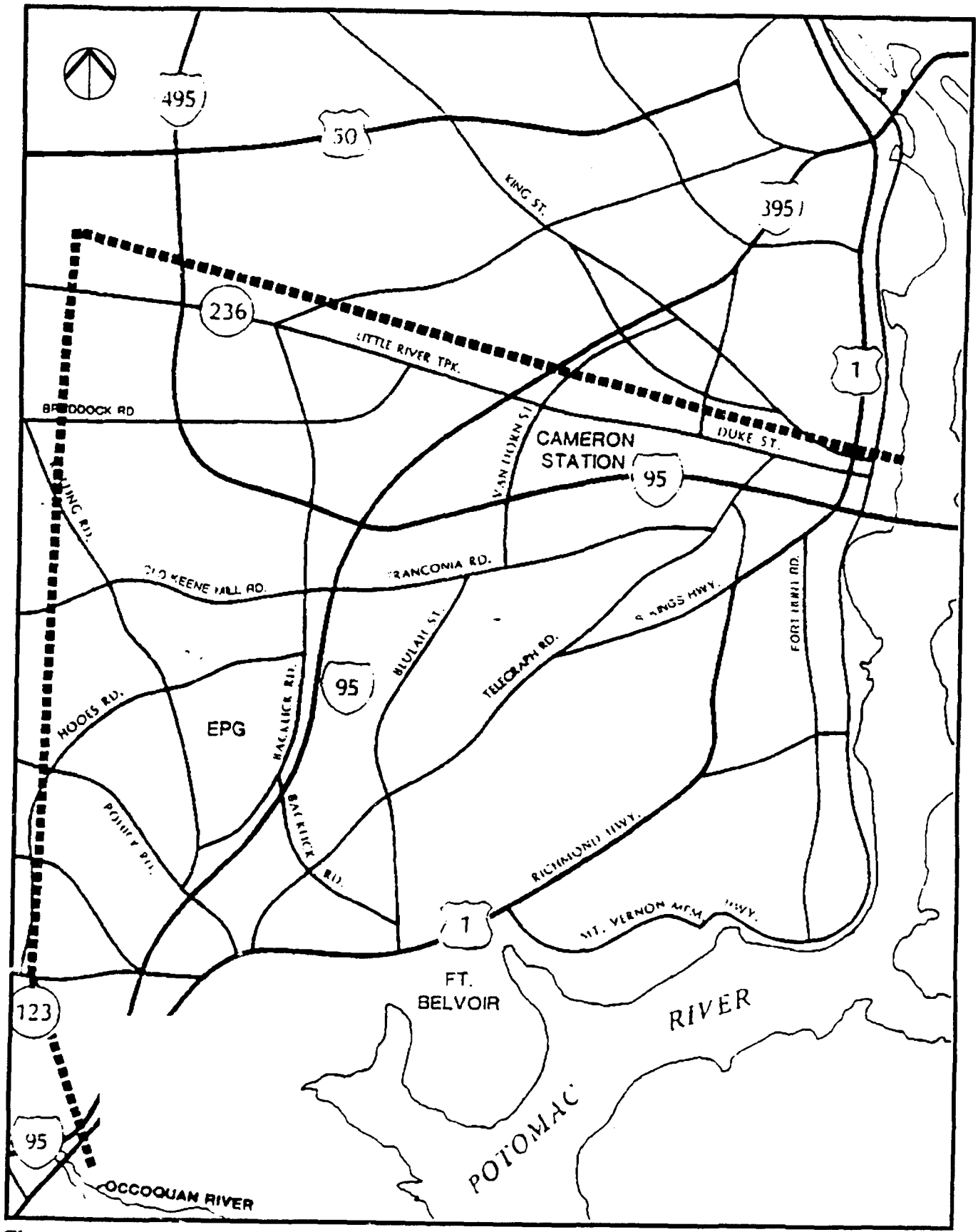


Figure 3-5
Regional Transportation Study Area

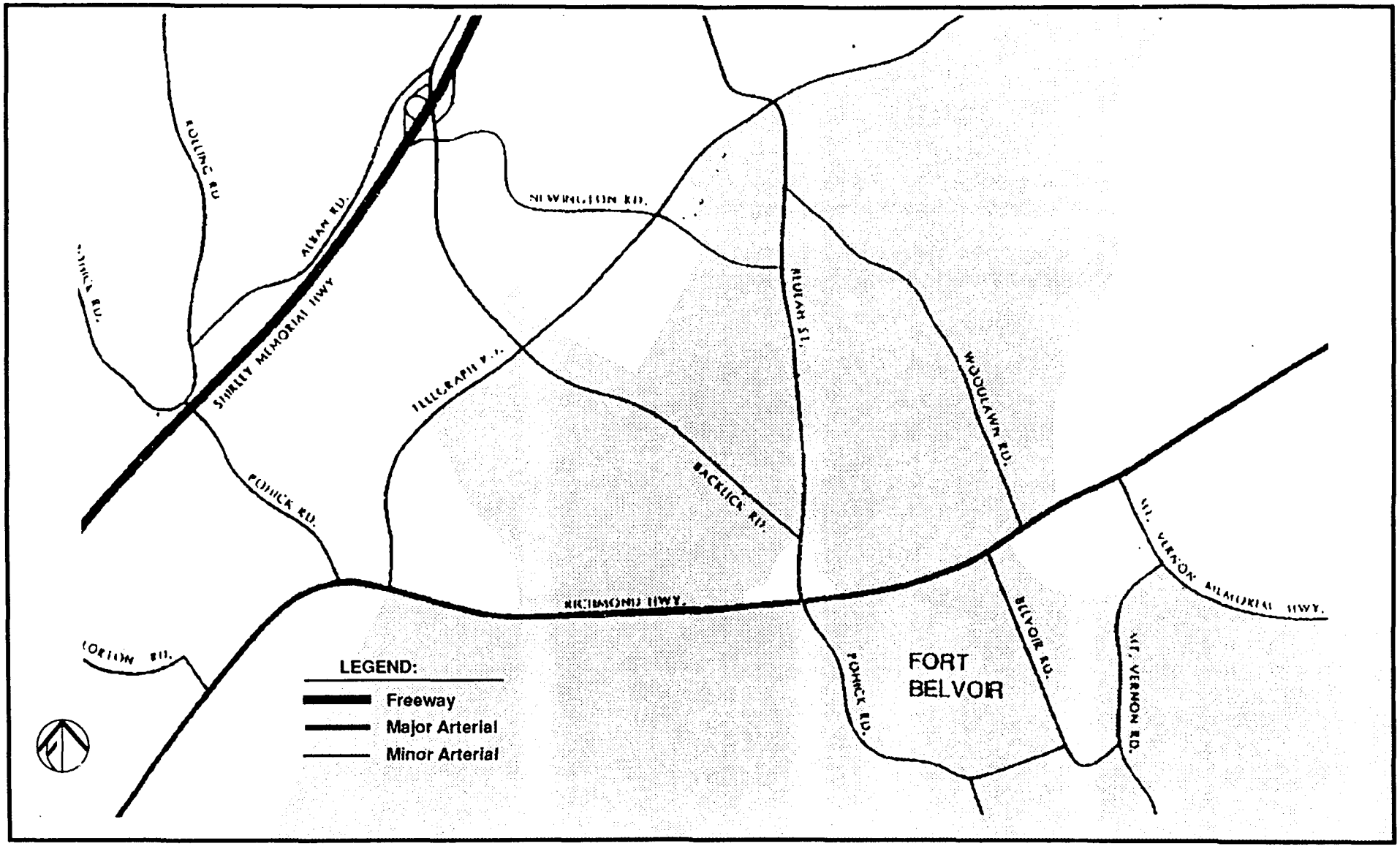


Figure 3-6
Roadway Classification
(Fort Belvoir Subregion)

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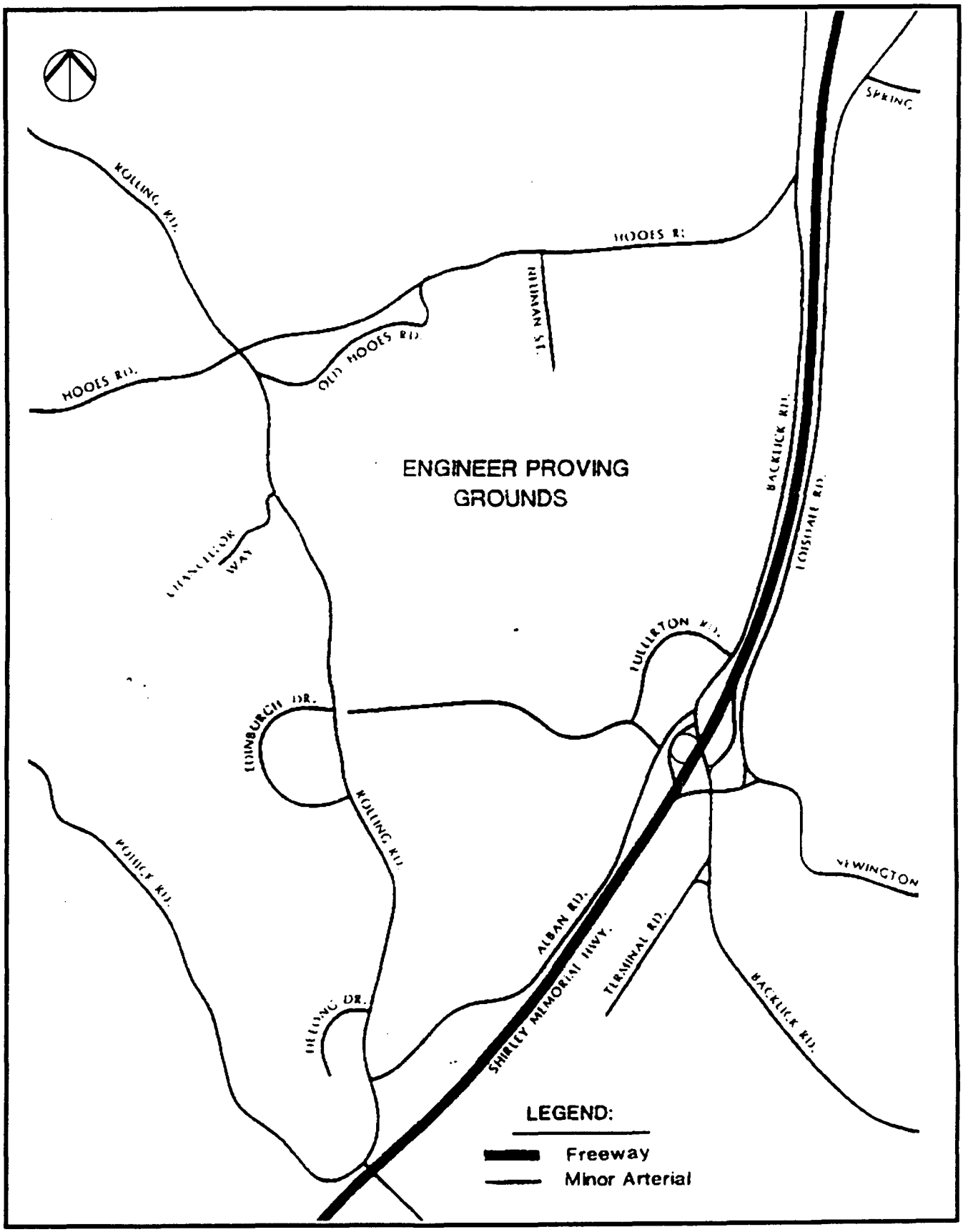


Figure 3-7
Roadway Classification
(EPG Subregion)

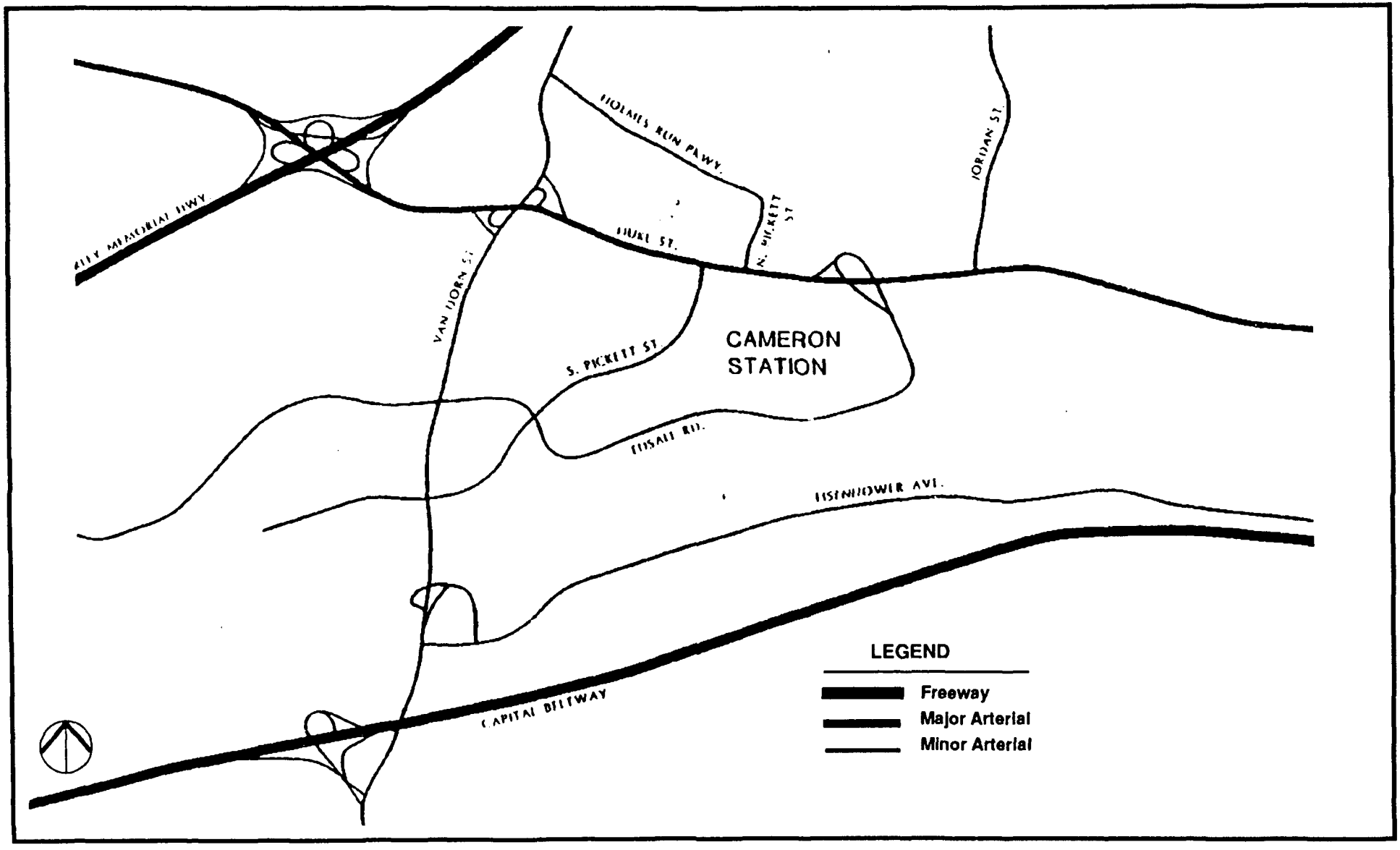


Figure 3-8
Roadway Classification
(Cameron Station Subregion)

3.2.3.7.1.3 Peak-Hour Traffic. The primary employment centers in the Washington Metropolitan area include downtown District of Columbia; Old Town Alexandria; the Pentagon; Crystal City; Rosslyn employment centers in Arlington County; and other suburban employment centers in Fairfax County, such as Tysons Corner. Commuting patterns are toward these centers during morning peak hours and away from them during the evening peak hours. Peak-hour volumes for the areas around Fort Belvoir, EPG, and Cameron Station can be found in the regional traffic study, *Fort Belvoir Regional Traffic Impact Analysis Assessment of Horizon Year Traffic Impacts.*

3.2.3.7.1.4 Circulation and Capacity. Traffic congestion and the quality of traffic flow was evaluated by computing the average delay experienced by vehicles approaching a signalized intersection over a peak hour. This is reported as an LOS. The current LOS for intersections in the region are presented in Table 3-22. The LOS for arterials are shown in Table 3-23. The roadways and intersections off post are under the jurisdiction and responsibility of VDOT or local public highway authorities. LOS D or better is the standard goal of Fairfax County.

3.2.3.7.1.5 Regional Roadway System Improvement Needs. Current traffic volumes and patterns show that the existing regional roadway network is unacceptable as demonstrated by the number of LOS Es and, LOS Fs in Tables 3-22 and 3-23. To achieve LOS D or better, certain improvements are necessary under existing traffic conditions. Recommendations from the VDOT's Northern Virginia Subregional Plan and Fairfax County's Comprehensive Plan were evaluated, as well as intersection needs.

A matrix of alternative lane improvements necessary to have achieved LOS D in 1990 is shown in Table 3-24. The intersection improvements that are necessary to achieve LOS D in 1995 without the development at Fort Belvoir are shown in Table 3-25. Widening Richmond Highway to six lanes from the Prince William County line to Buckman Road is not programmed but would be necessary for LOS D. Details of these improvements are presented in the Regional Traffic Study.

It should be noted however, that even without personnel realignments to Fort Belvoir, a number of roadway improvements are necessary and required for the region that is addressed in this EIS. The design, scheduling, and construction of improvements to these facilities are the responsibility of the public highway authorities.

3.2.3.7.1.6 Public Transportation. The Fort Belvoir area is currently served by five Metrobus routes. These five routes provide service along two basic alignments, both to the north of Fort Belvoir in Northern Virginia.

Table 3-22
CURRENT LEVEL-OF-SERVICE AT SIGNALIZED INTERSECTIONS

Road 1	Road 2	Existing LOS*	
		am	pm
Study Area: Fort Belvoir			
Armistead Road	Richmond Highway	E	C
Backlick Road	Telegraph Road	D	E
Backlick Road	Richmond Highway	C	F
Belvoir Road	Richmond Highway	B	B
Beulah Street	Telegraph Road	F	F
Mt. Vernon Road	Richmond Highway	E	F
Newington Road	Telegraph Road	C	F
Pohick Road (off post)	Richmond Highway	E	F
Richmond Highway	Woodlawn Road	B	D
Richmond Highway	Telegraph Road	D	F
Study Area: Engineer Proving Grounds			
Alban Road	Backlick Road	D	D
Alban Road	Boudinot Road	C	B
Alban Road	Rolling Road	A	B
Backlick Road	I-95	C	D
Backlick Road	Fullerton Road	C	B
Backlick Road	Newington Road	F	E
Backlick Road	Hooes Road	D**	C**
Hooes Road	Rolling Road	D	D
Old Hooes Road	Rolling Road	A	A
Study Area: Cameron Station			
Duke Street	Jordan Street	C	C
Duke Street	N. Pickett Street	B	B

Table 3-22
CURRENT LEVEL-OF-SERVICE AT SIGNALIZED INTERSECTIONS

Road 1	Road 2	Existing LOS*	
		am	pm
Duke Street	S. Pickett Street	C	C
Cameron Station (Cont'd.)			
Edsall Road	Van Dorn Street	D	F
Edsall Road	S. Pickett Street	C	C
Eisenhower Avenue	Van Dorn Street	F	E
S. Pickett Street	Van Dorn Street	C	E
Other Regional Intersections			
Commerce Street	Franconia Road	D	E
Duke Street	Quaker Lane	B	B
Fort Hunt Road	Richmond Highway	E	D
Franconia Road	Van Dorn Street	F	F
Lockheed Boulevard	Richmond Highway	B	B

*Level-of-Service
**Under construction

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Table 3-23
SUMMARY OF CURRENT ARTERIAL LEVEL-OF-SERVICE

Arterial	Segment	Arterial Class	Peak Direction Level-of-Service	
			NB am	SB pm
Richmond Highway	Occoquan to Backlick	I	D/E	D
Richmond Highway	Backlick to Mt. Vernon	I	B	C
Richmond Highway	Mt. Vernon to S. Kings Highway	II	B	B
Richmond Highway	S. Kings to Beltway	II	F	C
Arterial	**Segment**	**Arterial Class**	**NB am**	**SB pm**
Telegraph Road	Richmond Highway to Beulah	I	F	D
Telegraph Road	Beulah to S. Kings	I	B	C
Telegraph Road	S. Kings to Franconia	I	B	C
Telegraph Road	Franconia to Duke	II	F	D/E
Arterial	**Segment**	**Arterial Class**	**EB am**	**WB pm**
Duke Street	I-395 to Jordan	II	B	A
Duke Street	Jordan to Quaker	II	A	C
Duke Street	Quaker to Telegraph	II	B	A

Note: Arterial class and level-of-service are determined according to procedures defined in the *1985 Highway Capacity Manual*, *Special Report 209*, published by the Transportation Research Board.
NB - Northbound EB - Eastbound
SB - Southbound WB - Westbound
Source: JHK, 1990.

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Table 3-24
CORRIDOR LANE REQUIREMENTS, 1990

Scenario	Corridors						
	I-95	US-1				Telegraph Road (VA 611)	
		(A)	(B)	(C)	(D)	(A)	(B)
Existing	6*	4	4	4	6	2	2
Subregional Plan	3-2-3	6	6	6	6	4	4
Fairfax County Plan	4-2-4	6	6	6	8	6	6
1990 LOS D	3-2-3	6	6	4	6	2	2
or	6*	8	6	6	6	2	2
or	6*	8	4	4	6	4	4

*Plus peak-period HOV lane

Key

Corridor	Location
I-95	Occoquan to Beltway
US-1(A)	Occoquan to VA-611
US-1(B)	VA-611 to Backlick (FCP)
US-1(C)	Backlick (FCP) to Buckman
US-1(D)	Buckman to I-95
VA-611(A)	US-1 to Backlick (FCP)
VA-611(B)	Backlick (FCP) to Franconia

LOS = Level-of-service
HOV = High-occupancy vehicle
US 1 = Richmond Highway
FCP = Fairfax County Parkway

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Table 3-25 BASELINE INTERSECTION IMPROVEMENTS NECESSARY BY 1995 WITHOUT FORT BELVOIR DEVELOPMENT*
Fort Belvoir Study Area
1. Richmond Highway and Armistead Road
2. Richmond Highway and Pohick Road
3. Richmond Highway and Telegraph Road
4. Richmond Highway and Woodlawn Road
5. Richmond Highway and Mount Vernon Memorial Highway/Old Mill Road
6. Telegraph Road and Newington Road
7. Telegraph Road and Beulah Street
Cameron Station Study Area
1. Van Dorn Street and Edsall Road
2. Van Dorn Street and S. Pickett Street
3. Van Dorn Street and Eisenhower Avenue
4. Duke Street and S. Pickett Street
*Other improvements are planned and programmed by VDOT. Source: JHK, 1990.

Fort Belvoir's North Post is served by only one route (9B). Northbound service (i.e., departing the North Post) in the morning peak period consists of 4 trips with stops at the Huntington Metrorail Station, Old Town Alexandria, Crystal City, and the Pentagon. Southbound service to the North Post during morning peak hours is limited to one trip that leaves the Pentagon at 6:01 a.m. and arrives at the North Post at 6:50 a.m. Evening peak-period service in the North Post area consists of six total trips, three of which occur in the northbound direction (toward the Pentagon) and three in the southbound direction (toward Fort Belvoir). The North Post is also provided with midday, nighttime, and weekend service. The total number of trips (both directions) serving the North Post during these off-peak time periods is 7, 5, and 56 trips, respectively. Buses to the North Post run approximately every hour on Saturdays and Sundays.

Fort Belvoir's South Post is provided with service by all five bus routes that travel to the Fort Belvoir area. These five routes are scheduled along two different general paths.

Leaving Fort Belvoir, the first path (Metrobus Routes 9A/9B) runs northward along the Richmond Highway, Washington Street, and the Jefferson Davis Highway to reach the Pentagon. The Huntington Station and Crystal City Metrorail stations are served by these bus routes on the way to the Pentagon. Routes 9A and 9B, combined, operate 20 trips during the morning peak period (10 trips each direction), 22 trips midday (11 trips each direction), 18 trips during the afternoon peak period (8 trips northbound; 10 trips southbound), and 156 combined trips on weekends (80 trips northbound; 76 trips southbound). Buses run approximately every 30 minutes on Saturdays and Sundays.

The second alignment serving Fort Belvoir's South Post comprises three Metrobus routes (11H/P/Y). All three routes travel eastward on the Mount Vernon Memorial Highway (Route 235) and George Washington Parkway before turning north on Vernon View Drive. The routes then split at Waynewood Boulevard, with 11H/P continuing northward on Fort Hunt Road (Route 629) and Richmond Highway to the Huntington Metrorail Station and Route 11Y diverting eastward to George Washington Parkway. The three routes converge on Washington Street in Alexandria and travel along George Washington Parkway, before splitting again just south of National Airport. Routes 11H/P serve National Airport and continue to the Pentagon where they terminate. Route 11Y remains on George Washington Parkway, bypassing the Pentagon and continuing to Farragut Square in Washington, D.C., by way of 14th Street.

Service on routes 11H/P/Y is relatively infrequent. Buses run approximately every 35 minutes during the peak hours and hourly midday and weekends. Twelve total combined trips are operated during the morning peak period (7 northbound; 5 southbound). Slightly fewer trips (10 total) are run in the afternoon peak period (5 each direction), and a total of 12 trips are scheduled for midday service (6 each direction). During the weekend, 52 trips, or 26 in each direction, are run. Saturday service is more frequent than Sunday, with 28 of the 52 total weekend trips.

In summarizing existing bus service to Fort Belvoir, a conclusion can be made that service is very limited in terms of both headways and coverage. The only major trip generator linked to Fort Belvoir realistically is the Pentagon. Levels-of-service to National Airport and downtown Washington, D.C., are extremely limited. In addition, the travel time is relatively longer, at close to or over an hour one way, depending on the time of day. Geographic coverage by bus is nonexistent to the south and west of Fort Belvoir, and limited to the east and north. Midday and weekend service from the Pentagon to Fort Belvoir is adequate for the most part, but still the range of coverage in Northern Virginia is very limited. This would expand public transportation opportunities, in terms of both access and geographic coverage, for employees at the Fort Belvoir facilities.

3.2.3.7.1.7 Engineer Proving Grounds. Fairfax connector bus route 304 is the only public transportation service provided to the EPG. Route 304 is an express bus route connecting EPG with the Pentagon during peak hours on weekdays. Midday, evening, and weekend bus service to the EPG is not currently available. Fairfax connector

service provides four trips to the Pentagon during the morning peak period (6-9 a.m.) and nine trips from the Pentagon to EPG during evening peak hours (3:30-6:30 p.m.). The travel time in either direction by (Fairfax connector) bus between the Pentagon and EPG is about 40 minutes one way. Metrobus service to EPG has been assumed by the Fairfax connector bus system. Metrorail does not currently serve EPG.

3.2.4 CULTURAL RESOURCES

The National Historic Preservation Act of 1966 (NHPA), along with subsequent regulations and complementary legislation, such as Executive Order 11593 and the Archeological Resources Protection Act of 1979, codify the responsibility of federal agencies for cultural resource management. Section 110 of the NHPA requires federal agencies to "inventory, evaluate, and where appropriate nominate to the National Register of Historic Places (NRHP) all archeological properties under agency ownership and control." Fort Belvoir has been especially aggressive in compliance with the requirement for a cultural resource inventory. Investigative surveys have been done for much of the post over the last decade, excluding identifiable areas that had been severely disturbed before these requirements were promulgated.

MAAR Associates, Inc. (MAI) recently conducted an extensive survey of Fort Belvoir including EPG, mapped all known resource sites, and produced a predictive resource inventory of areas likely to be disturbed by training or future development. The report (Polk, 1990) that documented this survey and inventory, *Phase I Investigations of Various Development Sites and Training Areas, Fort Belvoir, Virginia*, also contained the compiled the results of previous surveys. This report is the source of the detailed information presented in this section, unless otherwise noted.

Archeological and historic investigations have been conducted on and in the vicinity of Fort Belvoir since the late 1880s. Early investigations of the ruins of Belvoir Mansion, the home of William Fairfax, began in the first decades of this century. Howard MacCord conducted a systematic survey along the shorelines of the Potomac River, Pohick Bay, and Accotink and Dogue Creeks in 1958, which identified five significant sites of prehistoric occupation. Several other, limited surveys were conducted in the 1970s.

The first comprehensive survey of the Fort Belvoir miiitary reservation as a whole was conducted by Soil Systems, Inc., under the sponsorship of the National Park Service. Approximately 1,400 acres were surveyed, including areas containing known resources or that were scheduled for development, as well as a statistically selected sample of the rest of the post. This study identified 34 archeological sites (LeeDecker, et al., 1984). In 1987, Fairfax County Heritage Resources conducted another major survey, which resulted in a complete inventory of archeological resources along the tidal shoreline of Fort Belvoir.

A number of other, mostly smaller and project-specific, surveys were done in the 1980s, including Phase I (investigative) and Phase II (evaluative) surveys for the proposed Fairfax County Bypass, performed by the Karell Institute from 1981 to 1983. This

survey resulted in a determination of eligibility for three sites to the NRHP. In 1988, MAI prepared a disturbance assessment survey (Polk, 1988) that identified areas of Fort Belvoir where previous disturbances make it unlikely that any archeological resources remain. MAI then drafted a preservation plan to help direct future cultural resource management at Fort Belvoir (Ralph, Traver, and Baumgardt, 1988).

Altogether, the various investigative (Phase I) studies have resulted in the identification of 229 cultural resource sites on Fort Belvoir, containing both prehistoric and historic artifacts and features. These resource sites have been registered with the Virginia Department of Historic Resources and Fairfax County Heritage Resources. Table 3-26 lists the cultural resource surveys conducted at Fort Belvoir to date.

Evaluative (Phase II) investigations have been done for 17 sites at Fort Belvoir. Belvoir Manor has been placed on the NRHP, and six other sites are eligible for listing. The remaining 10 sites were determined to be ineligible. Many more sites still remain to be evaluated for eligibility on the NRHP list.

3.2.4.1 Historic Resources

3.2.4.1.1 Historic Context. Colonial settlement began in what is now Fairfax County in the last half of the 17th century. Tobacco planters who originally settled to the south of Fort Belvoir extended their farming into the area as soils were depleted in earlier fields. The first land patents were issued for the area between Accotink and Dogue Creeks in 1669. In the 1680s a ferry crossing at the Occoquan River and a road, called the Potomac Path, improved overland transportation into Fairfax and contributed to further settlement.

In the early 1700s, the tobacco plantation society of the area developed around large plantations such as Mount Vernon, the Belvoir estate, and Gunston Hall. Land originally granted to William Green in 1669 was bought by William Fairfax in the 1740s, and included in the Belvoir estate. Lord Fairfax lived at the estate from 1745 to 1761. The Belvoir manor house burned down in 1783 (Fehr, et al., 1988).

Land in the interior was settled in the mid- to late-18th century. William Triplett established the Triplett farm to the northeast of what is now Fort Belvoir in the 1770s. By the end of the 18th century tobacco plantations in the Tidewater area were beginning to be replaced by less extensive, family farms growing diversified crops, setting the pattern for the Fairfax area that continued into the mid-20th century.

After the Civil War, Fairfax County began to grow rapidly. Large farms were subdivided into smaller ones, which supplied much of the food for the growing cities of Washington and Alexandria. A number of Quakers moved into the area during this time, establishing the Woodlawn Friends Meeting House. Woodlawn Baptist Church was also established nearby, marking the Woodlawn area as a focus of settlement. Another focal area was Accotink, with a post office, school, Methodist church, grist mill, and several stores. A third area around which family farms tended to cluster was the Pohick Church area (LeeDecker, et al., 1984).

Table 3-26
ARCHEOLOGICAL INVESTIGATIONS CONDUCTED AT FORT BELVOIR TO DATE

Year	Author(s)	Description of Project
1869	Anthropological Society of Washington	Accotink area AmerIndian ossuary[1]
1891-1893	Holmes, Dinwiddie & Fowke	Potomac River survey
1889-1892	Holmes	Potomac River survey[1]
1924	Karrick & Koloss	Belvoir Manor ruins
1931-1933	Schulz	Belvoir Manor ruins[2]
1957	MacCord	Recreational survey
1972-1976	Shott	Belvoir Manor ruins[2]
1977	Gardner & Carr	Railroad spur
1977	Gardner, Curry & Custer	Housing area
1981	Karell Institute	Springfield Bypass, Phase I
1983	Koski-Karell	Springfield Bypass, Phase II[2]
1984	LeeDecker, et al.	Sample survey and evaluation of resources
1984	Johnson	Belvoir Life Care Facility
1985	Johnson	Accotink storm drainage
1986	DEH	Capital Area Office
1986	Johnson	Pohick sewerage pipeline
1986	Johnson	Timber harvesting
1986	Henry	Information Systems Command Facility
1987	Henry	HEC History Center & Museum
1987	Johnson	Shoreline survey
1987	Middleton	Cemetery inventory
1988	Fehr, et al.	Defense CEETA Facility (Phase I)
1989	Johnson & Owsley	Owsley Plantation site
1989	McLearen	Woodlawn Road widening
1989	Ryder	Woodlawn Road widening, Phase II
1990	Polk	Various development sites & training areas

[1]Location of site currently unknown
[2]Reinvestigation of site(s)
Source: Polk, 1990

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A series of land transactions by the War Department, which ended in 1918, resulted in the establishment of a training area in Fairfax County, Virginia, for the Engineer Barracks (Polk, 1990). This training facility was designated Camp A. A. Humphreys in 1917, and renamed Fort Humphreys after World War I. Development of the post occurred in several stages, most notably the accelerated growth during World Wars I and II. Fort Humphreys was renamed Fort Belvoir in 1935, in recognition of the Belvoir Manor and estate.

The Army Engineer School and associated administrative buildings, built from 1928 to the 1930s, constitute some of the most attractive and historic structures on the post today. A predominant use of the facility throughout its history has been for military and engineer field training, which many of the historic military sites reflect. The current development of Fort Belvoir as an administration center marks the beginning of another distinct period in the installation's history.

3.2.4.1.2 Historic Resources Identified. Remains from early historic period occupations in the Fort Belvoir area are mostly domestic and agricultural in character, with the largest number of sites dating to the mid-19th and early 20th century. However, Colonial-period remains have been found at a total of 18 sites dated to the mid-18th century. It is possible that some of those 18th century sites may be masking evidence of earlier occupations from the late 17th century, such as have been discovered at Mount Vernon.

The most notable of the Colonial period resources are the ruins of Belvoir Manor. This site has been the subject of several excavations, beginning in the early 20th century. Extensive excavations of Belvoir Manor were sponsored in the 1970s by the Army Engineer Museum. Artifacts removed from the site are now held by Fairfax County Heritage Resources. The Belvoir ruins have been stabilized to preserve them, this having been begun in the late 1960s, and some cosmetic landscaping, path construction, and placing of information signs has been done around the site. Recommendations have been made to further enhance the site to increase the number of visits.

Other plantation sites found in the Fort Belvoir area include Cedar Grove Plantation, owned by the McCarty family, on the peninsula between Pohick and Accotink Creeks; the Owsley Plantation, which is the earliest Colonial-period site on Fort Belvoir, dating to the early or mid-18th century; and the remains of a tenant house on a plantation once owned by the West family, located in the Castle Park area of Tompkins Basin on the South Post. Both the Owsley Plantation and West family sites have been determined to be eligible for listing on the NRHP.

A number of family farm sites from the mid-19th to the early 20th century have been identified. Several historic cemeteries have been recorded and fenced, including the Woodlawn Friends Meeting House and Cemetery, the Woodlawn Methodist Cemetery, Cedar Grove Cemetery, Lacey Hill Cemetery, a mid-18th to late 19th century cemetery, the Triplett family cemetery, and the Telegraph Road or Potter family cemetery.

Some evidence of rural industry, including evidence of 18th to 19th century brick and tile manufacture in an area once known as Brick Yard Landing has also been found. A possible 19th century store and school have been located, as well as indications of 19th century fishing activity.

The other primary type of historic resource found at Fort Belvoir is, predictably, military in nature and dating mostly from the 20th century. There are, however, some identified military historical resources predating the establishment of Camp A. A. Humphreys.

No significant military action took place in the immediate area during the American Revolution, although some troop movement took place along Telegraph and Old Colchester Roads. It is possible that further investigation in those areas may produce remains of temporary encampments or items dropped in transit.

Earthworks associated with a small battle during the War of 1812, the Battle of Whitehouse Point, have been located in the Fort Belvoir ruins area. Other remains from campsites, fortifications, and the Whitehouse Point bombardment are considered likely to be found through further Phase I investigation.

Few Civil War military remains have been or are likely to be found at Fort Belvoir, because no military action, beyond skirmishes and encampments, took place any closer than the Manassas and Bull Run area. The nearest known Civil War earthworks are some attributed to Confederate forces, located near Occoquan (Polk, 1990).

3.2.4.1.3 Historic Districts and Structures. Fort Belvoir contains a designated historic district on the South Post (Figure 3-9), which includes the Parade Ground; parts of the former Engineer School and associated administrative area; the Gerber Village and Belvoir Village Family Housing areas; and some other nearby housing. Any development in or contiguous to this area must maintain compatibility with the style of the buildings, most of which were constructed between 1928 and 1935 and are representative of the Colonial and Georgian Revival style. An installation design guide, which includes architectural details for constructing projects in the historic area, has been adopted for Fort Belvoir.

Also on South Post is the Fairfax Historic Area, which surrounds the Belvoir Manor ruins and the graves of Colonel William and Deborah Fairfax. This approximately 60-acre, protected area is located southeast of Fairfax Village, extending generally from Fairfax Drive to the Potomac shore and to approximately 800 feet east of the Ponton Basin. This area is accessible, from Fairfax Drive, to visitors interested in local history.

The majority of the Woodlawn Historic District is located adjacent to Fort Belvoir. The Woodlawn Historic District incorporates Woodlawn Plantation, which is adjacent to the Lewis Heights family housing area on the North Post, and extends onto Fort Belvoir to include the Woodlawn Cemetery and crosses Richmond Highway at the intersection of Belvoir Road.

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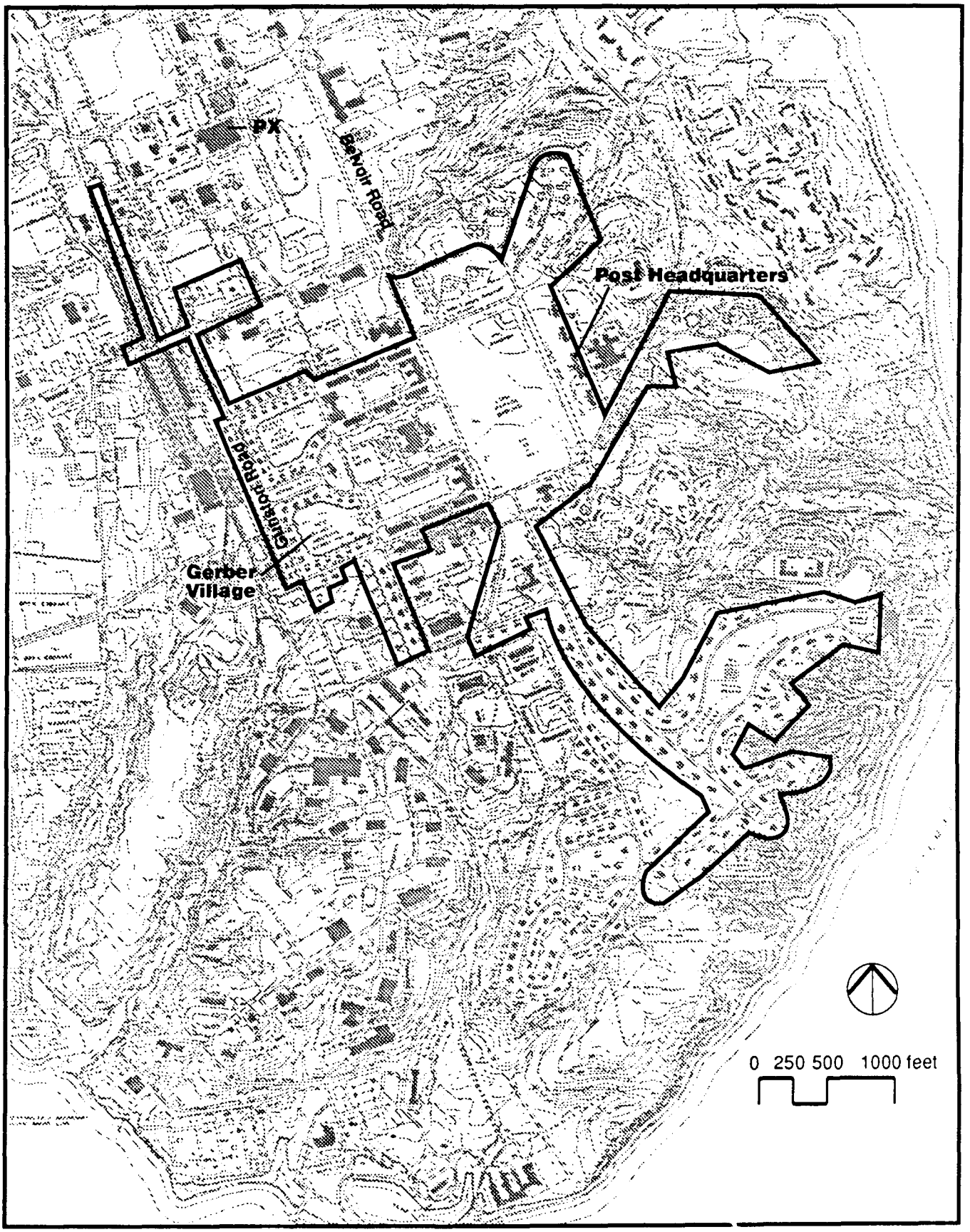


Figure 3-9
Fort Belvoir Historic District

More than 50 buildings in the Woodlawn Historic District are rated at evaluation category 3 or higher, meaning that they are historic properties of importance and contribute to the cultural heritage or visual interest of the facility (DEH, August 17, 1990). Six of these have historically significant interiors as well as exteriors:

- MacKenzie Hall (Building 20A)
- Bachelor Officers' Quarters (Building 20B)
- Hill Hall (Building 257)
- Thayer Hall (Building 270)
- Fairfax Chapel (Building T435)
- Thermo-Con House (Building 172)

Although relatively modern (1949), the Thermo-Con House has been given the highest rating of category 1, indicating it to be a historic property of great importance. Known variously as the Thermo-Con House, Gunston Road House, or Building 172, it was designed by Albert Kahn Associates as a prototype for an innovative method of building lightweight houses intended for mass production of housing, by using concrete injected with air or chemicals. It is the only example of its kind known to exist. Its unique nature, along with its association with a famous designer, resulted in its category 1 designation.

3.2.4.2 Archeological Resources

The following prehistoric temporal units were used to describe archeological resources at Fort Belvoir in the MAI report (Polk, 1990):

1.	Paleo-Indian	about 10000 - 8000 B.C.
2.	Early Archaic	about 8000 - 5000 B.C.
3.	Middle Archaic	about 5000 - 3000 B.C.
4.	Late Archaic	about 3000 - 1000 B.C.
5.	Early Woodland	about 1000 - 400 B.C.
6.	Middle Woodland	about 400 B.C. - A.D. 1000
7.	Late Woodland	about A.D. 1000 - A.D. 1600

The Fort Belvoir Preservation Plan uses the following classifications to describe archeological resources:

1.	Paleo-Indian	before 7410 B.C.
2.	Hunter-Gatherer I	7540 - 6010 B.C.
3.	Hunter-Gatherer II	5860 - 4000 B.C.
4.	Hunter-Gatherer III	4000 - 2000 B.C.
5.	Hunter-Gatherer IV	2750 B.C. - A.D. 800
6.	Early Agriculturalist	A.D. 800 - A.D. 1607
7.	Protohistoric	1607 - A.D. 1750

Fort Belvoir is currently reconciling the differences in the two classification systems to bring the MAI (Polk, 1990) report data in line with their preservation plan classification system. The overlap in the classification system accounts for geographical differences in culture development. For the purposes of this discussion, the periods used correspond to the periods that Polk uses to describe those sites where enough information was available in investigative (Phase I) surveys to determine a temporal assignment except the Protohistoric Period, which was not included in the MAI report. A number of aboriginal sites could not be accurately dated without further study, and are merely designated as "prehistoric."

There are few sites dated to the Paleo-Indian period. Most occupations can be assumed to have been in Coastal Plain areas that were later submerged by a rise in sea level following the Pleistocene era. Artifacts found at three sites on Fort Belvoir are probably remains of forays into what was then the interior, rather than from habitation sites.

Similarly, only three sites dated to the Early Archaic period have been identified. One site is considered to be a remnant of an occupation, which is now mostly submerged. However, the two sites located along Dogue Creek may be interior settlement sites, which would be of more research value.

Ten sites dating to the Middle Archaic period have been identified at Fort Belvoir. These sites are located not only in estuarine areas, but also on low interior terraces, high coastal terraces, and high interior terraces, reflecting the stabilization of the shoreline environment during this period. Three sites have been determined by a Phase II investigation to be eligible for listing on the NRHP. One site was determined to be ineligible.

Late Archaic sites are more numerous at Fort Belvoir. Twenty-nine sites with components dating to this period have been identified, 17 of which are located along tidal estuaries, illustrating the settlement patterns of this period. Because many of these estuarine sites are of mixed periods, and some are also dominated by historic period artifacts, significant information about Late Archaic behavior is not readily available from these sites. Other sites which are located on interior terraces, are smaller in terms of the number of artifacts, and probably represent temporary upland hunting/gathering camps, as opposed to the estuarine base camps.

The most well-represented prehistoric period at Fort Belvoir is that of the Early Woodland, with 31 identified sites. These sites tend to be in similar or overlapping locations with Late Archaic sites, and are distinguished by the presence of fragments of the prehistoric ceramics that came into use in this period. The larger and more intensively occupied sites are located mostly near the tidal estuarine portions of Accotink, Pohick, and Dogue Creeks. One site is considered to be an extensive shellfishing-oriented site. A smaller group of sites from the Early Woodland period are found on terraces near creeks in the interior, and are thought to be temporary foraging campsites.

There are 26 sites identified as having originated during the Middle Woodland period. Ceramic fragments are typical of those sites, with differences in material differentiating them from the Early Woodland components of these frequently overlapping period sites. Again, most sites are located along the tidal creeks, but two sites are located on high interior terraces and one on a high bluff above the Potomac and are thought to be temporary seasonal campsites.

Twenty-six sites situated largely in estuarine areas have been dated to the Late Woodland era. Seven are located along Pohick Creek, up to the mouth of the creek. Only one Late Woodland site is located on a high terrace in the interior. This site is isolated and relatively undisturbed, and is considered a good candidate for comparative study with estuarine sites.

No Protohistoric sites have been identified at Fort Belvoir. Maps of the English exploration period indicate Indian settlements in this area however, including a 1612 John Smith map showing several "Doag" villages along the Potomac near Fort Belvoir. Therefore, it is possible that sites dating to the Late Woodland period might also contain Protohistoric components, such as have been found on the west side of Mason Neck. Further evaluative studies are needed to confirm this theory.

A large group of prehistoric sites (114) in various settings could not be definitely assigned to a temporal period. Many others contain components of several different periods, or are overlain by historic occupations, making it difficult to extract useful information from them. Nevertheless, Fort Belvoir can be considered rich in prehistoric archeologic resources; many sites having high integrity and study potential.

3.2.4.3 Visual Resources

There are many visually aesthetic qualities associated with Fort Belvoir that are attributable to its diverse terrain, natural resources, and history. Some of these aesthetic values include:

- A panoramic view overlooking the Potomac River, along bluffs that form the shoreline of the South Post
- A shoreline that includes a large marsh area important to fish and wildlife
- Metamorphic outcropping of rocks
- Steeply sloping hillsides with a diverse array of vegetation
- Wetlands associated with beaver habitat and waterfowl populations
- The combined 1,315-acre Accotink Bay Wildlife Refuge and Nature Study Area and Jackson Miles Abbott Wetland Wildlife Refuge

- Wooded areas throughout the facility, but especially on North Post
- Large, open grassy areas such as parade grounds, golf courses, and playing fields
- Tree-lined streets with large brick buildings in the Colonial/Georgian Revival style on South Post
- Building complexes surrounded by trees and open spaces, with large, mature trees shading many of the developed areas
- The ruins of Belvoir Manor, which have been preserved and enhanced for visitors interested in local history
- Other historic attractions such as Woodlawn Plantation, adjacent to one of the family housing areas

3.2.5 HAZARDOUS MATERIALS

Hazardous and toxic wastes are generated and managed on Fort Belvoir, especially in the many research and development areas throughout the installation. Most of these areas produce a wide variety of laboratory reagent chemicals. Additional areas of hazardous waste generation include the DeWitt Army Community Hospital (pathological and out-dated medications), motor repair shops (solvents, paints, and fuels), and building maintenance shops (solvents, pesticides, paints, heating oils, cleaning chemicals, PCBs, and asbestos).

The installation has operated under a Resource Conservation and Recovery Act (RCRA) Part A Interim Status Permit since November 1980. This permit allows the installation to store hazardous waste in aboveground containers, typically 55-gallon drums, and in bulk underground tanks. Thermal treatment of waste is also allowed by the permit. In 1989, Fort Belvoir generated and disposed, through permitted hazardous waste treatment facilities, approximately 500 tons of hazardous waste. The RCRA Part A permit was issued by the EPA and responsibility for the permit was transferred to the Commonwealth of Virginia in the early 1980s. Fort Belvoir applied for several final permits in 1990 (two RCRA Part B Permits and one Subpart X Permit) to continue the storage and treatment operations.

The Commonwealth of Virginia has conducted an annual hazardous waste inspection on Fort Belvoir since 1983. The last inspection conducted in February 1990 resulted in Fort Belvoir receiving a Notice of Violation (NOV) in April 1990. The NOV identified 35 points in the management of hazardous waste on the installation that violated Virginia regulations. Of these points, 25 involved administrative deficiencies, 4 were violations in the operation of the program, and 6 were violations in the engineering condition of the storage facilities. All violations except seven have been corrected. Fort Belvoir submitted a correction plan for the remaining violations to the

Commonwealth of Virginia in June 1990. Fort Belvoir is awaiting approval before proceeding. None of the 35 points identified any ongoing pollution.

3.3 FORT MYER

Previous development at Fort Myer has resulted in most of the property being cleared for construction or other uses. As a result all of the preferred alternatives and alternative 2 sites for each of the BRAC projects can be adequately described through the general discussion below.

3.3.1 PHYSICAL/CHEMICAL RESOURCES

3.3.1.1 Physiography and Topography

Fort Myer consists of 256 acres and occupies a plateau in Arlington County, Virginia, overlooking the Potomac River and Washington, D.C. (Figure 3-10). The eastern portion of the site is cut by several ravines of varying depth and steepness. The western portions of Fort Myer have less relief. The terrain varies from 100 to 235 feet above MSL across the post (U.S. Army, MDW, 1984). Fort Myer is located within the mixed Piedmont Upland and high Coastal Plain Terrace section of the transition zone between the Piedmont and Coastal Plain physiographic provinces. This section of Arlington County is along the Fall Line (USDA, 1955).

3.3.1.2 Geology and Groundwater

The geology of the general area is discussed in more detail in Section 3.2.1.2. Soils in this area have been formed from granite gneiss and quartz schist and the sedimentary deposits are primarily fluvial, old alluvial, and marine. The sedimentary deposits usually occupy areas with broad ridge-tops and undulating slopes of less than 10 percent (USDA, 1955).

Groundwater from the shallow aquifer at Fort Myer occurs from a depth of 4.5 to 7.5 meters. Shallow groundwater on the installation is not used as a potable water supply. The Patuxent aquifer of the Coastal Plain aquifer system underlies Fort Myer and could function as a source of potable water, along with water from the weathered and fractured top section of crystalline bedrock. Municipal water use began the early 1940s and is currently the source of water for Fort Myer. Before municipal supply, water was most likely obtained from these aquifer systems. According to historical information, Fort Myer operated six water wells during the early 1900s. These wells were located north of Whipple Field off Marshall Drive (USATHAMA, 1984).

Reportedly, two additional wells were drilled on Fort Myer in 1965 to a depth of approximately 1,500 meters. The wells were 6.35 centimeters in diameter and sample cores were recovered. The nature of the boring is believed to have been exploratory. The wells were plugged on completion of the sampling (USATHAMA, 1984).

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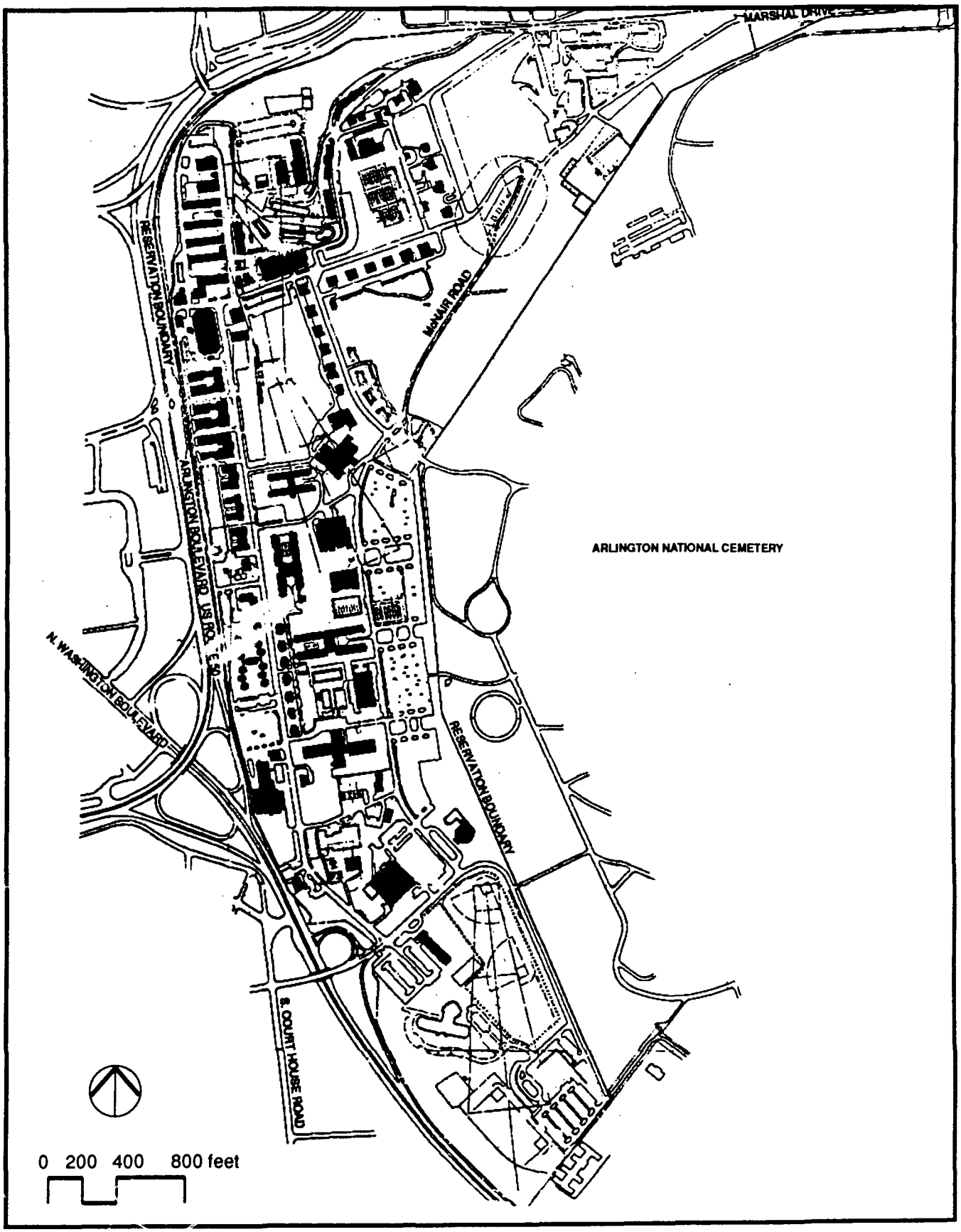


Figure 3-10
Fort Myer

Regionally, the deep Coastal Plain aquifer system consists of the Patuxent aquifer, the Patapsco aquifer, and the Magothy aquifer. This aquifer system increases to the southeast as the sedimentary deposits thicken and become more extensive. Aquifer recharge occurs from precipitation in the outcrop areas of each formation and from downward leakage through the confining beds in some areas (USATHAMA, 1984).

3.3.1.3 Soils

Soils on Fort Myer fall into three associations: Glenelg-Elioak-Manor, Manor-Glenelg-Elioak, and Fairfax-Beltsville-Glenelg (USDA, 1955). Except for the Beltsville soils, which have perched water tables, the soils on the post are relatively well drained. The Manor-Glenelg-Elioak soil series are subject to severe erosion if not protected. The Fairfax soils are subject to moderate erosion if cleared of vegetative cover (USDA, 1955).

3.3.1.4 Surface Water

Fort Myer lies outside all currently mapped floodplains. A small unnamed intermittent stream runs along the southwestern boundary of the post. The stream is shallow but appears to receive a large amount of runoff through culverts and drains, from Fort Myer. The stream is a tributary of Four Mile Run, which drains into the Potomac River (U.S. Army, MDW, 1984).

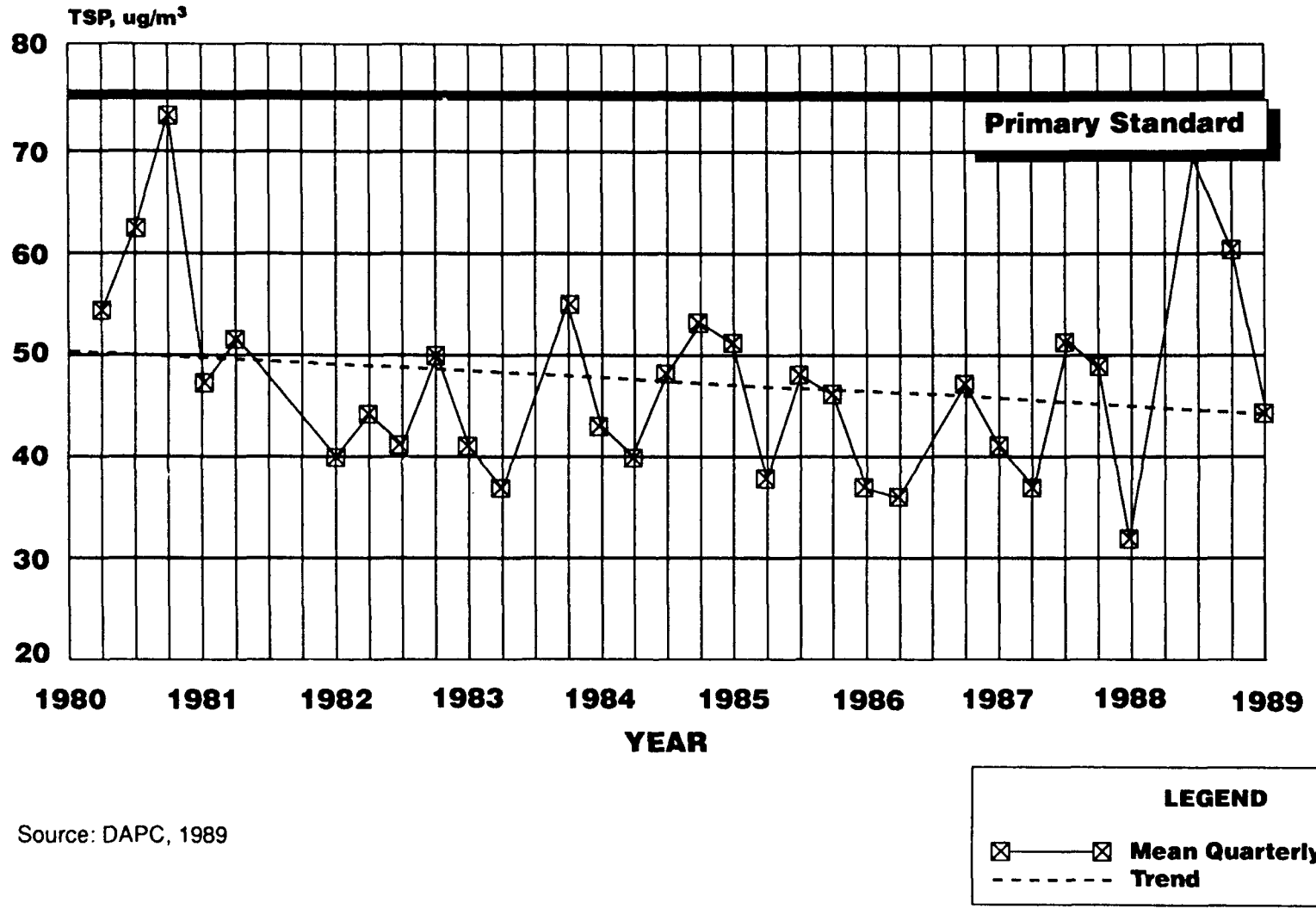
3.3.1.5 Climate and Air Quality

The climate and air quality of the Fort Myer area influence, and are influenced by, the same phenomena that affect all of northern Virginia. A detailed regional discussion is included in Section 3.2.1.5. The air quality discussion that follows is specific to the Fort Myer area.

The DAPC maintains a monitoring station at the Aurora Hills Fire Station, approximately one mile southeast of Fort Myer. Measurements are made with a high-volume sampler. Adverse impacts to air quality generated from Fort Myer would come from the gasoline storage tanks, combustion boilers and vehicular traffic. Both the boilers and the gasoline storage tanks at Fort Myer are in compliance with emission regulations (U.S. Army, MDW, 1984).

Ambient air quality in Arlington County complies with EPA attainment criteria for all air quality parameters except ozone (DAPC, 1989). However, because the larger National Capital Interstate AQCR--Virginia Portion (EPA Region III, DAPC Region VII) does not meet criteria for CO, the entire air basin is currently designated as a nonattainment area for this pollutant (DAPC, 1989).

The trend in TSP at the Aurora Hills sampling station for the past 9 years is shown in Figure 3-11. TSP has actually decreased slightly over this period (dashed line), but the difference is not statistically significant (DAPC, 1989).



Source: DAPC, 1989

Figure 3-11
Region VII - 9-Year Trend for Total Suspended Particulates (TSP)
Arlington, Virginia

The maximum level of CO measured at the Aurora Hills sampling station in 1989 over a 1-hour period was 8.3 ppm, which is well below the primary National Ambient Air Quality Standard of 35 ppm. The maximum level of CO measured over an 8-hour period was 7.0 ppm, also below the primary standard of 9.0 ppm. Arlington County has not violated either of the standards over the past 5 years (DAPC, 1989).

Figure 3-12 shows the annual trend of NO_2 levels at Aurora Hills over the past 5 years. During this period NO_2 levels rose slightly (dashed line), but the difference is not statistically significant (DAPC, 1989). In all cases, the annual levels recorded have been well within the primary standard of 0.05 ppm.

No violations of O_3 criteria were recorded in 1989 at the Aurora Hills sampling station (DAPC, 1989). However, there have been regional violations of O_3 criteria at this station over the past 7 years: three in 1982 and 1983, two in 1984, one in 1985, two in 1986, five in 1987, and nine in 1988 (DAPC, 1988, 1987). These violations are not attributable solely to the operations at Fort Myer.

3.3.2 BIOLOGICAL RESOURCES

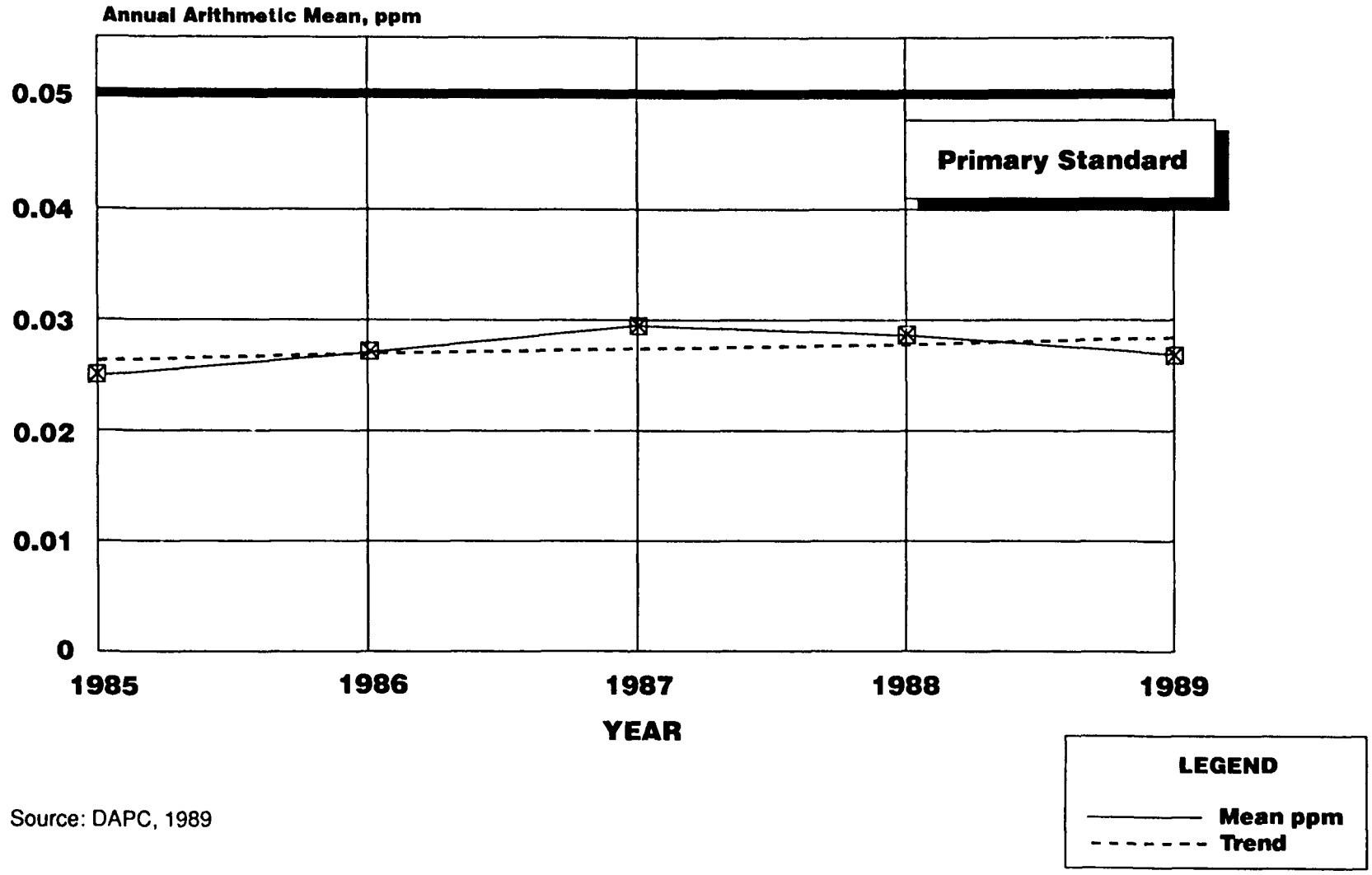
3.3.2.1 Terrestrial Biota

3.3.2.1.1 Vegetation. Most of the native vegetation has been removed from Fort Myer because of past development and training activities. However, substantial numbers of both native and introduced tree and shrub species have been planted for landscaping on the post. Vestiges of native vegetation still remain between McNair Road and Arlington National Cemetery, and between Sumner Street and the north boundary, as well as in a smaller area near Washington and Grant Avenues. The remnant native vegetation is composed primarily of oaks, hickories, and maples.

3.3.2.1.2 Wildlife. Because of the development at Fort Myer and the lack of native vegetation, the species of wildlife frequenting the post are limited to those adapted to an urban environment. Some species that may be using Fort Myer include the eastern gray squirrel, chipmunk, eastern cottontail, raccoon, American robin, European starling, house sparrow, house finch, northern mockingbird, rock dove, mourning dove, Carolina chickadee, and tufted titmouse. Migrating warblers may use the small wooded area near the boundary with Arlington National Cemetery during migrations, but the small size of this area would preclude most from nesting.

3.3.2.2 Wetlands

The intermittent stream on the southwestern boundary of the post has a small area of palustrine forested wetlands associated with it. The wetlands are confined to each side of the stream channel, and are separated from the developed areas of the post by the perimeter fence.



Source: DAPC, 1989

Figure 3-12
NO_2 Trend, Annual Arithmetic Mean
Arlington, Virginia

3.3.2.3 Aquatic Biota

No surveys have been performed in the intermittent stream at Fort Myer. The small size of the stream, less than 10 feet wide, and the shallowness, 2 to 4 inches, preclude use of the stream by most aquatic organisms.

3.3.2.4 Threatened and Endangered Species

The BATES completed as part of this EIS located no rare, threatened, or endangered species at Fort Myer. The developed nature of the post would preclude colonization by these species.

3.3.3 SOCIOECONOMIC CONDITIONS

3.3.3.1 Land Use

Table 3-27 shows the existing land use at Fort Myer. Of the approximately 256 acres that comprise Fort Myer, slightly more than half (approximately 155 acres) is currently developed. The remaining 101 acres are used as parade grounds and recreational open space. Figure 3-13 shows the current land use pattern on Fort Myer.

Surrounding off-post land, except for the Arlington National Cemetery to the east, is almost entirely dedicated to low- and medium-density residential use. A small area at the northern Rolfe Street boundary is given to medium-density residential use with 31-32 dwelling units per acre. The remainder of the northern boundary as well as the western boundary are immediately adjacent to Arlington Boulevard (Route 50) and Washington Boulevard. These main thoroughfares separate the post from most other land uses.

West of Arlington Boulevard are low- and medium-density residential areas with a small shopping center opposite Henry Gate on North Pershing Drive. The U.S. Marine Corps Headquarters facility, Henderson Hall, is also located along the southern post boundary. Several multistory buildings provide housing for the marines. To the east, the post is separated from Arlington National Cemetery by a low brick wall along the entire length of the boundary.

3.3.3.2 Population

3.3.3.2.1 Arlington County. Fort Myer is located in Arlington County, Virginia. Arlington County lost population in the 1970s. The county has registered small increases for each year from 1983 to 1988 (Table 3-28). The stabilization of central jurisdictions of the Washington, D.C., metropolitan area may be partly explained by increases in births during the last few years along with reduced population shifts to suburban areas.

Table 3-27
EXISTING LAND-USE PATTERNS AT FORT MYER

Category	Approximate Acreage	% of Total
Open Operational Areas		
Ammunition Storage	0.7	0.3
Parade Ground	16.3	6.4
Built-Up Cantonment Areas		
Administration	8.1	3.2
Community Facilities	36.8	14.4
NCO Family Housing	7.9	3.1
Officer Family Housing	16.4	6.4
Troop Housing and Support Faciiities	44.9	17.5
Unaccompanied Officers' Housing	3.4	1.3
Medical	6.0	2.3
Recreation	84.8	33.1
Service and Storage	28.0	10.9
Training	2.7	1.1
TOTAL	**256.0**	**100.0**

Source: U.S. Army, MDW, 1983

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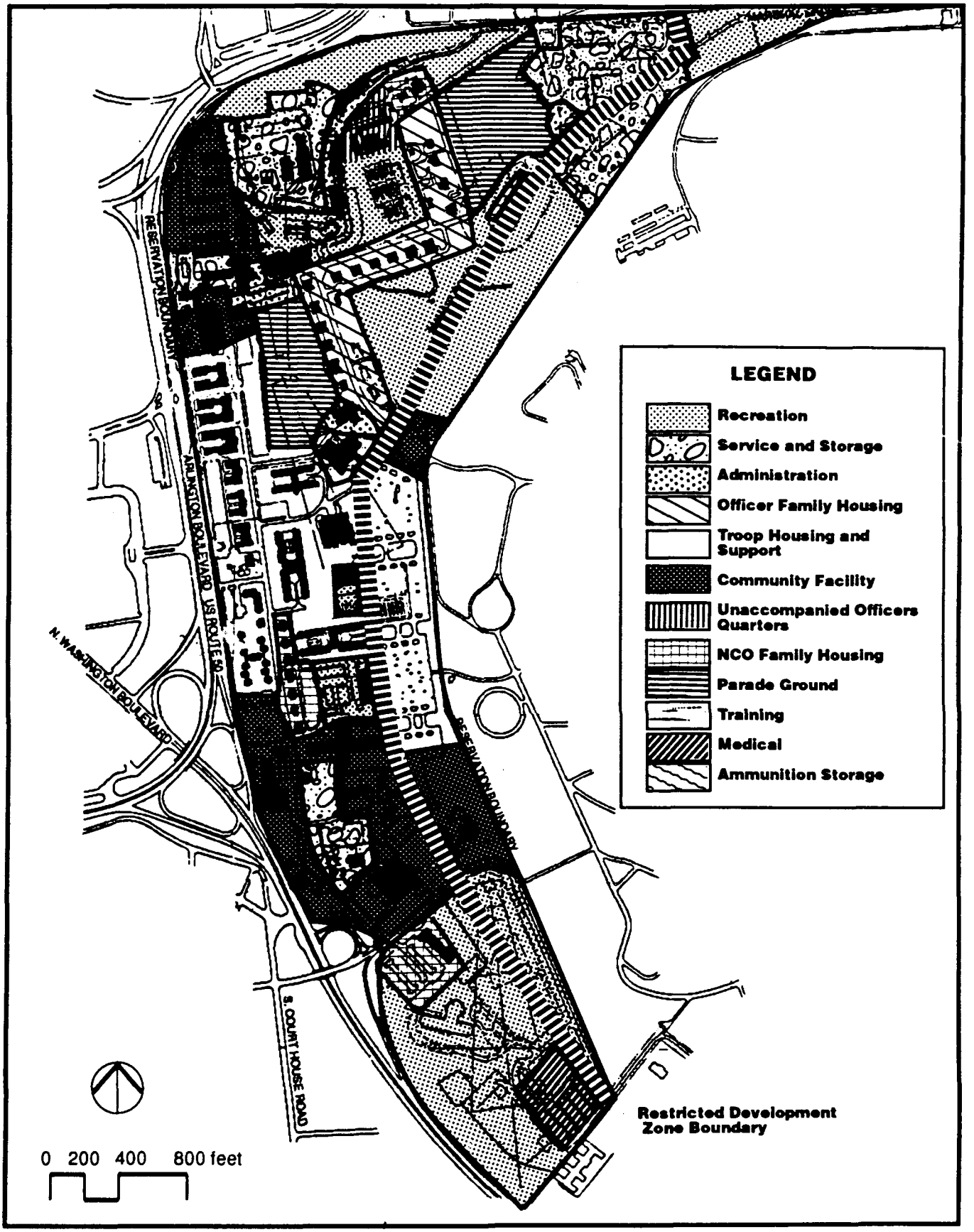


Figure 3-13
Fort Myer Existing Land Use

Table 3-28 POPULATION TRENDS IN ARLINGTON COUNTY, 1983-1988			
Year	Arlington County Population	Average Annual Change (Percent)	
		Arlington County	Washington, D.C., MSA
1983	153,200	-0-	-0-
1984	153,400	0.1	1.4
1985	153,600	0.1	1.4
1986	154,900	0.9	1.8
1987	158,900	2.6	3.0
1988	161,900	1.9	3.7
Source: Metropolitan Washington Council of Governments, 1989. Local government estimates and the Bureau of the Census reports.			

3.3.3.2.2 Fort Myer. The current population of Fort Myer is 3,854 military employees, 1,258 civilian employees, and 630 military family members. This represents 3.5 percent of Arlington County population on the basis of 1988 data.

3.3.3.3 Housing

3.3.3.3.1 Arlington County. New housing constructed in the County of Arlington represented approximately 3.1 percent of the total of new housing constructed in the Washington metropolitan area during the period from 1983 through 1988 (Table 3-29). Construction of single-family dwelling units represented approximately 24 percent of the total number of residential units constructed in Arlington County. This was the third lowest percentage of single-family construction in the jurisdictions of the Washington, D.C., metropolitan area.

3.3.3.3.2 Fort Myer. As part of its mission, Fort Myer provides housing for military personnel in the MDW, as well as for high-ranking senior officers stationed in the Washington, D.C., area. Housing is currently divided into two types, family housing and unaccompanied personnel housing.

The unaccompanied personnel housing, or barracks, at Fort Myer can house up to 3,887 enlisted personnel. A dining facility for enlisted personnel is located in proximity to the barracks.

Officer family housing is allocated for the Chairman of the Joint Chiefs of Staff and the Chiefs of Staff for the Army and the Air Force. In addition, quarters are allocated for 22 general officers, 6 colonels, 6 field-grade officers, 3 company-grade officers, and their families.

Table 3-29 HOUSING TRENDS IN ARLINGTON COUNTY, 1983-1988				
	Total Residental Units Constructed	**Single-Family Units Constructed**	**Percent Single Family**	**Percent of Total Region**
Arlington County	6,998	1,678	24.0	3.1
Washington, D.C., MSA	223,446	170,749	76.4	100.0
Source: Metropolitan Washington Council of Governments, 1989. Permit-Authorization Construction in Selected Permit-Issuing Places. U.S. Department of Commerce, Bureau of the Census, C-40 Reports.				

Quarters are also provided for 140 non-commissioned officers and their families. These families are housed in one of three ways: single-family home, duplex, or high-rise apartment.

3.3.3.4 Employment

3.3.3.4.1 Arlington County. The County of Arlington experienced a 24.2 percent increase in jobs during the period from 1983 through 1988 (Table 3-30).

Employment in Arlington County ranged between approximately 7.3 percent and 7.8 percent of the total number of jobs in the Washington, D.C., metropolitan area during the period between 1983 and 1988.

3.3.3.4.2 Fort Myer. Fort Myer currently employs a total of 3,854 military and 1,258 civilian personnel, which is approximately 3.3 percent of the employment in Arlington County, based on 1988 data.

3.3.3.5 Income

3.3.3.5.1 Arlington County. In 1983, and through 1987, Arlington County has had the greatest per capita income in the Washington, D.C., metropolitan area for each year, with the exception of 1986 when it had the second highest per capita income (Table 3-31).

3.3.3.5.2 Fort Myer. The average salary at Fort Myer is $24,482 per year for military personnel and $25,198 per year for civilian personnel.

Table 3-30
EMPLOYMENT TRENDS IN ARLINGTON COUNTY, 1983-1988

	Nonagricultural Wage and Salary Jobs (Thousands)						
	1983	1984	1985	1986	1987	1988	Percent Change
Arlington County	125.1	138.0	142.3	147.7	154.6	155.4	24.2
Percent of Total Employment in Washington, D.C., MSA	7.5	7.8	7.6	7.6	7.6	7.3	--

Source: Metropolitan Washington Council of Governments, 1989. Compiled by MWCOG, from the District of Columbia Department of Employment Services, Maryland Department of Economic and Employment Development, and Virginia Employment Commission Reports.

Table 3-31
ANNUAL PER CAPITA INCOME IN ARLINGTON COUNTY, 1983-1987

	1983	1984	1985	1986	1987
Arlington County	$20,610	$22,325	$23,994	$25,926	$27,243
Washington, D.C., MSA	$16,109	$17,519	$18,935	$20,148	$21,539

Source: Metropolitan Washington Council of Governments, 1989. U.S. Department of Economic Analysis Regional Economic Analysis, Regional Economic Information System.

3.3.3.6 Community and Army Facilities

Potable water is supplied to Fort Myer by the Washington Aqueduct Division of the U.S. Army Corps of Engineers. Water is piped from the Dalecarlia Reservoir in northwest Washington, D.C., and Montgomery County, Maryland, through a 16-inch main. The water is distributed from this line by both a 6- and 10-inch main on the post. Both of these lines feed the pumping station located in Building 301, which increases the water pressure and meters the demand. Total capacity of the pump station is 2,400 gpm. For the most part, all of the mains are located adjacent to roadways, and hydrants are all readily accessible. In 1986, the peak domestic water demand was estimated to be 1,108 gpm. The number of personnel that the existing water supply system could effectively support is estimated at 12,000 (U.S. Army, MDW, 1987).

In addition to the main water supply, Fort Myer has an emergency use connection to the Arlington County water distribution system. Under emergency conditions, the county would open a valve on the 10-inch feeder to Fort Myer and could supply between 0.5 and 1 mgd (U.S. Army, MDW, 1987).

Wastewater from Fort Myer is collected, routed, and treated at the Arlington County Sewage plant. Peak flow rates of sewage from the post in 1986 were estimated to be 3,953 gpm, leaving an unused capacity of 1,409 gpm for future expansion (U.S. Army, MDW, 1987). The existing system could effectively support a post population of approximately 9,300 (U.S. Army, MDW, 1987).

The Washington Gas Light Company supplies natural gas to Fort Myer through three high-pressure, steel mains. All of the feeder lines, distribution lines, reducing regulators, meters, and other distribution and metering equipment is owned and maintained by Washington Gas Light Company. The existing agreement guarantees a minimum pressure of 20 pounds per square inch to the post (U.S. Army, MDW, 1987).

Electrical power is supplied to Fort Myer by Virginia Power through three 13.8-kilovolt feeders. One of the feeders is considered standby, however, and used only during peak demand and emergency situations. The average peak demand from November 1985 through October 1986 was 4,886 kilowatts, and the average offpeak demand was 4,732 kilowatts. Peak hours are on weekdays only, between 10 a.m. and 10 p.m., June through December, and between 7 a.m. and 10 p.m. from January through May (U.S. Army, MDW, 1987).

Until the end of the 1979-1980 school year, Arlington County Schools operated a grade school for dependents at Fort Myer. The school was closed at the end of that year because of low enrollments, and the facility is now used for administrative and community activities. All of the school-age family members residing at Fort Myer are currently enrolled in the Arlington County School system and attend Long Branch Elementary, Thomas Jefferson Junior High, and Wakefield Senior High schools located off post.

Off-post fire protection is provided by Arlington County Fire Companies 1, 4, 5, and 10. Police protection is provided by the Eads, South, and Courthouse police stations and the police headquarters.

Police and fire protection on post are provided internally. A kennel is located at Fort Myer, which provides training and maintenance areas for the security patrol dogs. Fort Myer currently has a two-story fire station, as well as adequate hydrant connections (U.S. Army, MDW, 1983, 1984).

There are churches of several denominations located close to Fort Myer (within 5-6 miles). In addition to Arlington National Cemetery, the Custis Lee Mansion, and the nearby attractions of Washington, D.C., several neighborhood and county parks and recreational facilities are located in the vicinity of Fort Myer. Several county libraries are also located in proximity to Fort Myer.

The Main Chapel (Building 335) is used primarily for military funerals and is not available for post activities. The Memorial Chapel (Building 480) is available for post activities.

Four regional shopping centers are located within a short driving distance from Fort Myer. Numerous shops and services are located close by, along Pershing Drive (near Fort Myer's Henry Gate), Washington Boulevard, Wilson Boulevard in Clarendon, and Columbia Pike.

Heat for the various buildings on Fort Myer is provided in two ways. The main heating plant consists of four oil-fired boilers with an existing capacity of 92,000 pounds per hour (lb/hr) and total capacity of 132,000 lb/hr. A smaller, secondary heating plant contains two oil-fired boilers with an existing capacity of 10,250 lb/hr and a total capacity of 20,500 lb/hr. These boiler plants provide heat through steam lines to the majority of the buildings at Fort Myer. Buildings not serviced by the central heating system are heated by individual units fired either by fuel oil or natural gas (U.S. Army, MDW, 1987).

In addition to the Army facilities described above, Fort Myer also provides other facilities, which include a post office, bank, bowling center, clothing sales center, commissary, PX, the Andrew Rader U.S. Army Health Clinic, skill development center, child care center, continuing education facility, gymnasium, officers open dining facility, 3rd Infantry Museum, youth center, recreation center, theater, thrift shop, indoor racquetball courts, and a variety of outdoor playing courts and ball fields as well as four swimming pools.

3.3.3.7 Traffic and Transportation

Fort Myer was not included in the Fort Belvoir regional traffic impact analysis. The Army plans to conduct a traffic study of the Fort Myer area to obtain current baseline traffic loadings, levels-of-service, and descriptions of conditions in the locality in response to existing traffic congestion. There is no recent VDOT traffic data available. The most recent traffic information currently available is that found in master planning documents for Fort Myer. The following discussion is therefore a general one.

The main access roads servicing Fort Myer are Arlington Boulevard (Route 50) and South Washington Boulevard (Route 27). The northbound lanes of Washington Boulevard service the Second Street overpass leading to Hatfield Gate, the main entrance to Fort Myer. Arlington Boulevard provides a second entrance to the post at Henry Gate, the original main entrance to Fort Myer.

Fort Myer is also accessible from North Meade Street servicing Wright Gate at the northern boundary. Carpenter Gate at the southern boundary is closed to traffic, but could provide access to Henderson Hall and Arlington National Cemetery. Both Hatfield Gate and Wright Gate provide 24-hour access to Fort Myer. Henry Gate is closed from 11 p.m. to 6 a.m.

Two additional gates, Cemetery Chapel and Gibson, provide limited access to Arlington National Cemetery for ceremonies and maintenance.

The primary post roads are Marshall Drive, Jackson Avenue, Sheridan Avenue, and Henry Place. These are major thoroughfares providing access to the installation and connecting all of the major areas. The secondary road network, or collector-distributor system, is composed of Sherman Road, Custer Road, Lee Avenue, McNair Road, Wainwright Road, Pershing Drive, and Carpenter Road.

No signalized intersections exist on Fort Myer. Traffic control is limited to stop signs. Military police are used when additional temporary volume requires additional controls.

The majority of the military population employed at Fort Myer is housed on the post, which greatly reduces daily traffic volumes. The civilian employee population is on "flextime" to further minimize traffic during regional peak periods.

Fort Myer is served directly by Metrobus, and indirectly by subway service to the Courthouse, Rosslyn, and Arlington National Cemetery Metro Stations. A connector Metrobus from the Courthouse Metro Station is available for commuters. Fort Myer is also part of the MDW bus service, which shuttles employees between MDW operations.

3.3.4 CULTURAL RESOURCES

3.3.4.1 Historic Resources

Fort Myer, established in 1861, was originally named Fort Whipple. The post occupies land that once belonged to the Arlington estate of Robert E. Lee. The original mission of the post was to strengthen the defenses around Washington, D.C. (U.S. Army, 1975).

From 1863 to 1869, the post housed infantry and artillery troops. In 1869, the Signal Corps were garrisoned at the post and the Signal Schools of Instruction of Army and Navy Officers were established. The post was renamed Fort Myer in 1881. The Signal Corps School was discontinued in 1886, and Fort Myer became a cavalry post. In 1902, it was recommended that Fort Myer be designated a permanent post. Fort Myer houses the Old Guard Ceremonial Unit and the U.S. Army Band. In 1972, the northern portion of Fort Myer was designated a National Register Historic District, and Quarters 1 was designated a National Historic Landmark (Figure 3-14). Because of one part of Fort Myer's present mission, to provide housing for high ranking military personnel, it is often known as the "Home of the Generals" (U.S. Army, 1975).

3.3.4.2 Archeological Resources

There are no known archeological resources on Fort Myer. A cultural resource survey will be completed to locate any archeological resources that meet the criteria of the NRHP before starting any project that may have an adverse effect on cultural

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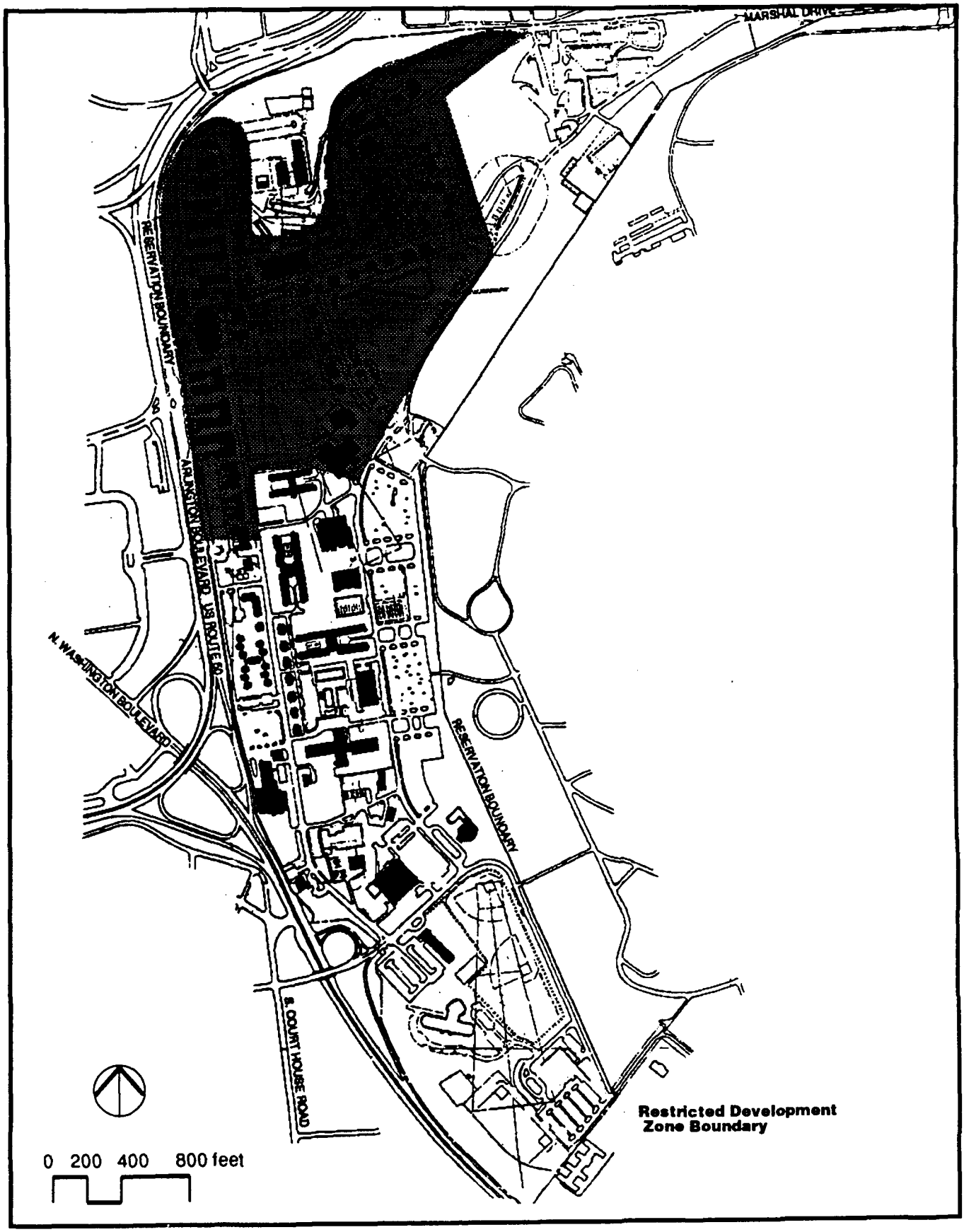


Figure 3-14
Fort Myer Historic District

resources. After completing this survey, the installation will notify the State Historic Preservation Office (SHPO) of the existence of any significant resources and complete the appropriate steps of NHPA, Section 106 (36 CFR 800)

3.3.4.3 Visual Resources

The aesthetic qualities at Fort Myer are primarily associated with the vistas of the Arlington National Cemetery, the Potomac River, and Washington, D.C. In addition, there are many historic structures located along tree-lined streets in the northern section of the post.

3.3.5 Hazardous Materials

Table 3-32 lists the activities that generate hazardous materials at Fort Myer. The underground storage tanks at the gasoline station and those that are used to store oil for the boilers are in compliance with all county, state, and federal regulations. No notices of violation have been issued for Fort Myer.

Table 3-32
SOURCES OF HAZARDOUS MATERIALS AT FORT MYER

Activity	Materials Generated
Former Dry-Cleaning Plant	Perchloroethylene
Sign Shop	Solvents
Auto Shop	Fuels, lubricants, solvents
Heavy Equipment Motor Pool	Underground storage tanks; petroleum, oils, lubricants
Museum	Multiple solvents
Paint Shop	Paints, solvents
Electrical Utilities	PCBs from leaking transformers (slated for removal)
Old Guard Motor Pool	Lead acid batteries, paints, solvents, sandblasting operations

The preferred alternative for the shoppette includes Building 448, the former dry-cleaning plant. USATHAMA has completed a preliminary assessment for perchloroethylene contamination. Of the 84 soil samples taken from around Building 448, 32 tested positive for perchloroethylene. In addition, two of the samples contained ethylbenzene. Gasoline-like hydrocarbons were detected in five of the samples; however, this contamination was unrelated to the laundry plant. A Phase II

environmental subsurface site investigation will be performed to determine the extent of the contamination and to develop remedial action plans.

The ammunition depot located near the intersection of McNair Road and Marshall Drive stores only ready-issue and ceremonial rounds. The facility meets all DOD safety standards for ammunition and explosives (U.S. Army, MDW, 1983). Surveys for asbestos will be conducted on Fort Myer and remediation will be completed as required.

3.4 FORT McNAIR

3.4.1 PHYSICAL/CHEMICAL RESOURCES

3.4.1.1 Physiography and Topography

Fort McNair consists of 88.9 acres and occupies the western portion of the peninsula between the Washington Channel and the Anacostia River (Figure 3-15). The land is generally flat. The seawall elevation is 4.2 feet (D.C. Datum Benchmark), and the site ranges in height to 17 feet in the middle of the golf course. Building areas are generally 10 to 12 feet in elevation.

3.4.1.2 Geology and Groundwater

The geology of the area consists of alluvium and artificial fill. The alluvium comprises gravel, sand, silt, and clay of lowest stream terraces and bottoms deposited in recent times. Contact with the underlying crystalline rocks occurs at a depth between 200 and 300 feet. Sound rock because of weathering could be as much as 50 feet below this contact. Groundwater is usually available near this contact.

3.4.1.3 Surface Water

There are no streams on post. Storm runoff is handled by a system of inlets and pipes outfalling into both the Anacostia River and the Washington Channel, which forms the western boundary of the installation.

3.4.2 BIOLOGICAL RESOURCES

3.4.2.1 Terrestrial Biota

3.4.2.1.1 Vegetation. Existing tree cover at Fort McNair includes tuliptrees, sweet gums, sycamores, oriental cherries, Norway maples, and lindens. These, the large oaks, and a few remaining American elms provide a pleasant visual environment, complement the historic architecture, define the large open spaces, and provide scale and texture as foreground to the views of the Washington Channel and the Anacostia River.

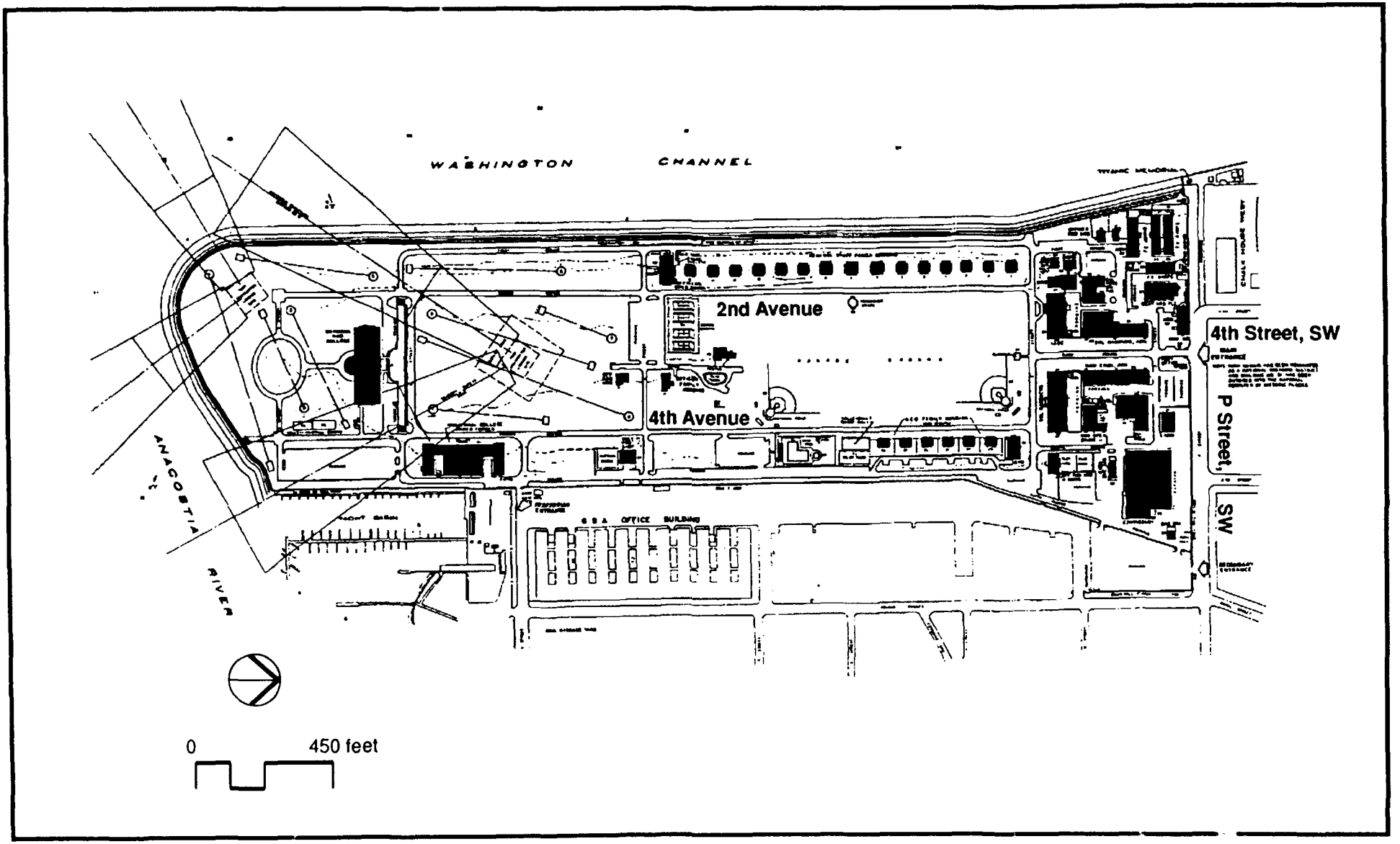


Figure 3-15
Fort McNair Site Map

The original master plan for Fort McNair proposed formal tree planting of single rows, regularly spaced, along each side of post roadways, including the Main Entrance Road (Third Avenue) and the Central Mall (parade ground and golf course), perimeter roads such as Second and Fourth Avenues, and B and E Streets.

Although there are trees planted along these roads, they are placed in an irregular pattern and, in many cases, two rows of varying species exist next to each other.

3.4.2.1.2 Wildlife. Wildlife on Fort McNair, which consists primarily of squirrels, chipmunks and various songbirds, is not a significant component of the post environment. Aquatic life in surrounding waters has been adversely affected from extensive dredge and fill operations, siltation, and toxic effects of heavy metals and chemicals. The situation is improving, however, and more important forms of aquatic life such as shad, alewife, perch, and catfish have appeared recently.

3.4.2.2 Wetlands

Fort McNair is separated from the water of the Washington Channel and the Anacostia River by a seawall. The seawall consists of approximately 4,886 linear feet of stone, brick, and concrete. It extends from the northwest corner boundary to the boundary wall on the east shore, where it connects to the yacht basin. The seawall and yacht basin preclude the formation of any tidal wetlands on the property.

3.4.2.3 Threatened and Endangered Species

No rare, threatened, or endangered species are located at Fort McNair. The developed nature of the post would preclude colonization by these species.

3.4.3 Socioeconomic Conditions

3.4.3.1 Land Use

3.4.3.1.1 Regional Development. Important development in the Fort McNair area includes the Southwest Urban Renewal Area, Waterside Mall, Waterfront Metro Station, Buzzard Point Development, Capital Gateway Complex, and the Southeast Federal Center projects.

The Southwest Urban Renewal Area is an area of mixed office, commercial, and residential uses immediately north of the post. It is a completely developed area, including high- and medium-density apartments, which reversed the population decline experienced before the 1950s. The South Capital Street-Buzzard Point area east of the post is a mixture of residential (including several attractive public housing projects), commercial, office, and industrial areas. The District of Columbia Office of Planning has targeted this area for upgrading.

East of South Capital Street is the Capital Gateway area, which is similar to Buzzard Point. Long-range plans, currently in abeyance, include an apartment and office

complex, with motel and hotel facilities, and waterfront and community facilities. East of the Capital Gateway Project is the site of the planned Southeast Federal Center in the Washington Navy Yard. Long-range plans call for office space for 10,000 to 15,000 federal employees.

3.4.3.1.2 On-Post Land Use. A study was made of the existing land use of the post to determine the size and area of land uses to be retained or changed in future.

The Reservation Plan indicates proposed land-use areas allocated to accommodate future requirements. A summary of the approximate acreage in existing and proposed land-use allocations is given in Table 3-33.

3.4.3.1.3 Adjacent Off-Post Land Use. The land use surrounding Fort McNair ranges from recently renewed residential development to blighted industrial areas. The Southwest Urban Renewal Area, immediately north and northeast of the post, consists of mixed-density housing, mainly mid- and high-rise apartments. Waterside Mall, where the Environmental Protection Agency offices are located, and where the future Waterfront Metro Station is to be sited, is only four blocks north of the main gate. These residential and government office uses are highly compatible with Fort McNair.

Industrial land use, including the Potomac Electric Power Company (PEPCO) Buzzard Point Generating Plant, dominates the area east of Fort McNair and south of Potomac Avenue. In varying stages of decline, the area is in dire need of revitalization according to the District of Columbia Office of Planning.

3.4.3.2 Population

The population in the neighborhoods around Fort McNair decreased from 13,500 in 1970 to 10,148 in 1980. The trend stabilized in the mid-1980s. Households in the area increased by about 430 by 1985, principally the result of construction of the Capital Gateway Development Project. The characteristics of the area population are changing, with more single people and young married and childless couples moving into the area. The resulting drop in school enrollments may affect the post's children who attend neighborhood schools.

3.4.3.3 Housing

3.4.3.3.1 Unaccompanied Officers' Quarters. Limited facilities are located on B Street at the north end of the post. Existing facilities can house 31 unaccompanied personnel and are used primarily for transients. Adjacent buildings, streets, and the parade ground preclude expansion of the existing area.

3.4.3.3.2 NCO Family Housing. A total of 12 units are located on Fourth Avenue at the northeast corner of the parade ground. These units are well located with respect to the community/recreational activities at the northern end of the post. A total of

Table 3-33
LAND-USE ALLOCATIONS AT FORT McNAIR*

Land Use	Existing		Proposed	
	Acreage	% of Total	Acreage	% of Total
Open Operational Areas				
Parade Ground	(7.8)**	-	(7.8)**	-
Built-up Cantonment Areas				
Administration	2.6	2.9	6.6	6.6
Community Facilities	6.3	7.1	6.4	6.4
Housing	17.0	19.1	17.9	17.9
(NCO Family Units)	(2.3)	(2.6)	(6.4)	(6.4)
(Officers' Family Units)	(11.1)	(12.5)	(7.9)	(7.9)
(Troop Housing and Support Facilities)	(3.3)	(3.7)	(3.3)	(3.3)
(Unaccompanied Officers' Quarters)	(0.3)	(0.3)	(0.3)	(0.3)
Medical	1.3	1.5	1.3	1.3
Recreation**	50.2	56.5	46.4	46.5
Service and Storage	2.3	2.6	1.7	1.7
Training	9.2	10.3	19.6	19.6
TOTAL ACREAGE	**88.9**	**100.0**	**99.9*****	**100.0**

*Master Plan Phase II, *Analytical/Environmental Assessment Report*, July 1984.
**Parade ground included in total recreational land-use category.
***Includes 10.5-acre acquisition-Tempo A & B site and 0.5-acre acquisition-T Street right-of-way.

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22 additional family units are planned between the existing development and C Street on the east side of the mall. This land allocation conforms to the McKim, Mead, and White Plan of 1903.

3.4.3.3.3 Officer Family Housing. There are 36 units of housing for officers' families sited in several locations on the post. Fifteen units of general-officer housing face the parade ground along Second Avenue; two units are located on First Avenue at the Washington Channel; and four units are located at the corner of Fourth Avenue and B Street.

3.4.3.3.4 Troop Housing. Existing barracks and attendant dining facilities for unaccompanied enlisted personnel are located at the north end of the post. The allocated areas are separated from the family housing areas and are within walking distance of medical and recreational activities. A total of 182 spaces are available at 90 square feet/person.

3.4.3.4 Community and Army Facilities

The Washington Aqueduct Division, U.S. Army Corps of Engineers supplies Fort McNair with water through two connections to the District of Columbia-owned 12-inch mains. The connections, located at the Main Gate (near Fourth and P Streets, SW) and the East Gate (Fifth Avenue and V Street, SW), are metered.

Water is distributed throughout the installation by a network of 6-inch and 8-inch cast-iron mains, which serve both domestic and fire protection functions. The system contains four major interconnected loops and several minor subloops. Sectionalizing valves are provided at loop intersections and every 300 to 500 feet between intersections. With few exceptions, the mains are located adjacent to roadways. Fire hydrants are readily accessible.

Wastewater collected at Fort McNair is discharged into the District of Columbia sewer system. Connections are made to the District of Columbia sewers at the northern boundary along P Street, and on Second Street at Q Street, T Street, and V Street.

Sewage treatment is provided by the District of Columbia's Blue Plains Treatment Plant before discharge into the Potomac River.

Natural gas is supplied to Fort McNair by the Washington Gas Light Company from a 6-inch, high-pressure main located in P Street, SW. The Washington Gas Light Company has two master meters and a pressure reducer located in Building 44. There is a fire shut-off valve in the 6-inch, high-pressure main to the meter building and a 10-inch, low-pressure main from the building that supplies the post. The system is capable of supplying all existing loads. The precise age of all piping is not known. The original piping was cast iron installed before 1959. Piping installed since 1959 has been of steel, except for a small change made in 1976, which is extra-heavy cast iron. Since that time, the cast iron pipe has been replaced with steel.

Fort McNair is served by PEPCO from its Buzzard Point 13-kilovolt substation located at First and V Streets, SW. The incoming 13.2-kilovolt underground feeders are the property of PEPCO, and the government owns the switching station equipment and the extensive underground distribution system on post. Telephone service at Fort McNair is supplied by the Chesapeake & Potomac Telephone Company.

Heating facilities for Fort McNair consist of gas- or oil-fired individual units and a high-pressure central heating plant. Twenty-seven buildings are connected to the central steam-distribution system.

On-post community facilities include the commissary, PX, a dental clinic, dispensary, and several recreational areas.

Nearly half of the total land area on post is devoted to recreation facilities, including the parade ground, Officers' Club, NCO Club and Gymnasium, and the nine-hole golf course, which surrounds the National War College. The parade ground and adjacent areas also contain softball fields, volleyball, basketball and tennis courts, and a swimming pool. Additional volleyball and handball courts are located at the south end of the installation.

3.4.3.5 Traffic and Transportation

3.4.3.5.1 Access Roads. Road access to Fort McNair is by the city street system with the primary traffic volume on 4th and P Streets, SW, the location of the main entrance. Traffic at the main entrance is controlled by a traffic signal installed by the District of Columbia Department of Highways. A secondary entrance located on P Street, SW, near Canal Street, is used as an entry point for all truck traffic and for access to the employee parking lot on the east side of the post.

3.4.3.5.2 Interior Roads. Primary traffic circulation is from the Third Avenue entrance road diverted at B Street into Second and Fourth Avenues, which parallel the mall. These roads are rather narrow (18 and 20 feet wide) and limit the volume of traffic, which the post can efficiently handle. A one-way loop provides the basis for internal circulation. The existing system effective controls the flow and volume of traffic and helps maintain the great dignity of the post.

3.4.3.5.3 Public Transportation. Fort McNair does not have direct rail access. Fort McNair is served by three Metrobus routes, 70, M2, and M5. The nearest Metrorail station will be the Maine Avenue Station on the Green Line, currently under construction.

3.4.4 CULTURAL RESOURCES

3.4.4.1 Historic Resources

As the oldest extant U.S. Army post, Fort McNair has a rich historical background. Built in 1791 on approximately 28.5 acres of land designated by Pierre L'Enfant for

military defense of the new Federal City, it has undergone many changes. The original fortifications and buildings, destroyed by the British during the War of 1812, were immediately rebuilt and reoccupied. Originally a fort, it later served as an arsenal, then became a general Army post in 1881. The Army War College and Engineer School were established in 1903. The post hospital became the General Hospital, which later moved to its present site as Walter Reed General Hospital.

The original master plan was prepared for the post in 1903 by the architectural firm of McKim, Mead, and White. This plan, sometimes referred to as a Beaux-Arts Campus Plan, exemplifies the classic principles of formality, symmetry, and balance. During the period from 1903 to 1908, the entire post was remodeled by the Corps of Engineers, which included the construction of most of the buildings that are on the post today.

The National War College was established in 1946, and today uses the original Army War College academic building. The Industrial College of the Armed Forces was established at Fort McNair in 1946, and in 1976, combined with the National War College to form the National Defense University.

Originally known as the Washington Arsenal, the post became known as Fort Lesley J. McNair in 1948 in honor of General Lesley J. McNair, who was killed at Normandy in 1944. During the intervening years, the post was known as the Washington Barracks, from 1881 to 1927; the Army War College, Washington, D.C., from 1927 to 1934; and Fort Humphrey, from 1935 to 1937.

Because of its historical significance as the oldest continuously used United States military post, the prestige of the National Defense University, and the architectural importance of its design and structures, Fort McNair meets the criteria of the National Register as a Historic District. The historic character of the post is to be maintained or restored as appropriate, and architectural compatibility achieved in future construction.

3.4.4.2 Archeological Resources

An archeological survey has not been performed at Fort McNair and is not presently being considered. No construction is planned at Fort McNair as a result of the BRAC action.

3.4.5 HAZARDOUS MATERIALS

Table 3-34 lists the sources of hazardous materials at Fort McNair. Small amounts of insecticides and herbicides are stored at Fort McNair for use on the golf course. There are small amounts of thinners and lacquers at the paint shop. Several PCB-containing transformers are in use throughout the post and are maintained in conformance with current EPA regulations governing PCB items. Regulated PCB transformers are being removed in accordance with applicable regulations. Fuel oil, No. 2 and No. 4, is stored in underground tanks and is closely monitored by engineering personnel. A post spill-prevention and spill-control program has been developed to provide guidance in cases of emergency. Surveys for asbestos will be conducted on Fort McNair and reme-

diation will be completed as necessary. MDW has been cited by the District of Columbia Department of Environment, Division of Hazardous Materials and EPA Region III for lack of training, improper handling and storage of hazardous materials, and storage of hazardous materials for more than 90 days. All of these violations are currently being addressed in accordance with the compliance agreement signed on March 30, 1990.

Table 3-34
SOURCES OF HAZARDOUS MATERIALS AT FORT McNAIR

Activity	Materials Generated
Paint Shop	Multiple solvents
AAFES Service Station	Fuels, lubricants, solvents, USTs
Motor Pool	Fuels, lubricants, solvents, USTs
Electrical Utilities	PCBs from leaked transformers; regulated ones slated for removal
Boiler Plant	Multiple chemcials

3.5 OTHER PROJECTS

3.5.1 PROJECTS CHANGED OR DEFERRED

As pointed out during the scoping process, several other projects were planned in the region, separate from base realignment and closure and the Fort Belvoir Concept Development Plan, which could add cumulative effects to the actions being addressed in this EIS. These projects included the move of AMC headquarters to a site at Fort Belvoir, along Backlick Road near the dirt road called John J. Kingman Road; the move of the HQUSACE to a site on the HEC; the EPG public/private development project; and the development project at the GSA parcel in Franconia. Since the time of scoping for this EIS, the plans for each of these projects have changed, with the exception of the EPG development project.

The AMC has decided to relocate its headquarters to EPG, and the effects of that project will be incorporated into the EIS being prepared for EPG. Both HQUSACE and GSA have indefinitely delayed their plans. Those projects cannot, therefore, be addressed in this EIS. The Concept Development Plan includes a 500-person administration facility (MCA 42) in the vicinity of the previously proposed HQUSACE site.

3.5.2 ENGINEER PROVING GROUNDS

3.5.2.1 Physical/Biological Resources

EPG is located in a gently rolling area between 200 and 300 feet above MSL. The site is heavily wooded and divided nearly in two by the steep-sloped, narrow stream valley

of Accotink Creek. On either side of the stream are broad, level terraces cut by steeply dissected slopes draining to the creek. Some of the slopes associated with the drainage ways are 15 percent or greater.

The site lies astride the boundary between two geologic provinces: the Appalachian Piedmont and the Coastal Plain. The geology of the Piedmont is characterized by metamorphic rocks, which produce soils of severe erodibility and are only marginally suited to septic tanks. The Coastal Plain sediments at EPG are poorly consolidated sand and gravel, predominantly of Cretaceous age overlain by Tertiary deposits of marine clay and esturine sand. Some hydric soils, generally associated with nontidal wetlands, are found among the mixed-alluvial soils on site.

The two sides of EPG as delineated by the creek have distinctly different ground cover. The eastern portion of the site is predominately cleared, and consists of field grasses and small areas where regeneration of native cedars and related species is occurring. Substantial tree cover is found around the edges of the eastern portion of the site and over the entire western portion, except for clearings for roads, buildings, and some small testing areas.

Fairfax County has indicated that the Accotink Creek stream valley, as an Environmental Quality Corridor, is included in the elements of EPG that would be included in a Resource Protection Area of the Chesapeake Bay Preservation Area to be established under The Chesapeake Bay Preservation Area Designation and Management Regulations.

3.5.2.2 Socioeconomic Conditions

Approximately 138 people work at EPG, 104 civilian and 34 military personnel. In addition, 10 to 12 people from the State Department and the D.C. National Guard occasionally use the facility.

Fairfax County is divided into planning districts. The EPG is located in the Springfield Planning District, which has a population of approximately 37,965, about 5 percent of the county total. Population in the area has been rising since 1980, a trend which is expected through the year 2000. By 2010, the population is expected to be 46,168.

The district contains approximately 14,493 housing units, including single-family homes, townhouses, multiplexes, and apartments. This number is forecast to increase to almost 20,517 in 2010. The average household size in this planning district is 2.71. This number roughly parallels the rest of the country and is expected to decline to less than 2.50 by 2010.

3.5.2.2.1 Land Use. The major use of land surrounding the EPG is housing. The remaining land is a mixture of small tracts of undeveloped land, some industrial uses, and a smaller amount of commercial development. Steadily increasing encroachment by these land uses on the EPG site has caused the uses of the site by the Army to be severely curtailed. During the 1940s and 1950s, EPG was used as a testing facility for

military engineering equipment. Most of these activities have been relocated to other sites or eliminated. Limited research activities still occur at one location on the site.

3.5.2.2.2 Community and Army Facilities. Police protection for the area around EPG is provided by the West Springfield District Police Station to the north of EPG, and the Franconia Station to the east. Fire protection in the vicinity of EPG is provided by the Springfield Volunteer Fire Company, located one-half mile from EPG on Backlick Road. The nearest schools to the EPG are four public elementary schools (Saratoga, Rolling Valley, West Springfield, and Garfield), St. Bernadette Parochial School, Irving Intermediate, and Lee High School. Seven churches are located close by. The Richard Byrd Library is on Old Keene Mill Road, north of EPG. A variety of local shopping centers are located along Old Keene Mill and Backlick Roads. Regional facilities are the same as previously described for Fort Belvoir.

Several parks are located close to or adjoining the EPG property. A stream-valley trail system is proposed for the Accotink stream valley, which cuts through EPG, connecting Accotink Stream Valley Park to the north with Accotink Park to the south of EPG.

No Army support facilities of note are currently located at the EPG; such facilities are located on the Fort Belvoir Main Post.

3.5.2.2.3 Transportation/Access. The area around EPG is served by a road network consisting of an interstate highway, state secondary roads, and local roads. Two county parkways have been proposed in the vicinity. Access to the EPG is currently limited to the main entrance on Backlick Road. There is another entrance onto Rolling Road which is not currently in use. The road network onsite consists of the Heller Loop on the eastern section of the property and another paved road, which follows the northern border, crosses Accotink Creek and winds across the western portion of the site to the closed gate at Rolling Road. Details of the regional transportation network can be found in the Fort Belvoir section of this report.

3.5.2.3 Cultural Resources

According to the Fort Belvoir staff, none of the 39 structures on EPG has any architectural significance. Five structures are to be included in a standing structures survey to be completed in the spring 1991. Approximately 370 acres have been so severely disturbed that archaeological surveys do not need to be conducted. The remaining 450 acres have been surveyed and no significant resources were found.

3.5.2.4 Hazardous Materials

Following USAEHA protocol, an Environmental Baseline Study (EBS) was initiated at EPG under the sponsorship of USATHAMA and the Argonne National Laboratory. The purpose of the study was to determine the nature and extent of contamination before the release or development of the property.

Phase I of the EBS was used to establish the scope of the subsequent phases and determine the potential for environmental contamination at EPG. Phase II of the EBS outlined the EPG's environmental setting, identified potentially contaminated areas, and recommended areas that will require further characterization. Forty-four potential hazardous waste sites were identified at the EPG. Phase III efforts were recommended for forty of the identified sites.

Phase III of the EBS included sampling of the existing transformers, sampling of Accotink Creek, and radon testing. Concentrations of contaminants are compared with applicable state and federal regulations, with background concentrations for metals, and with average concentrations of metals in soils in the eastern United States. Phase III verified the presence or absence of contamination and recommended future action. Contamination was present at 17 of the 40 sites. The contaminant of concern at these 17 sites is petroleum hydrocarbons. Radon was not detected in significant concentrations. Three of the 66 existing transformers contain PCBs in excess of the cleanup guideline stated in 40 CFR 751.1. The sediment and surface water samples from Accotink Creek were free from contamination.

Asbestos surveys have been conducted for buildings at EPG. Asbestos-containing building materials such as transit board, pipe insulation, floor and ceiling tile, and roofing were found in 11 buildings. The complete survey report, including the recommendations for control and management of asbestos-containing building materials is available through the Environmental and Natural Resources Division at Fort Belvoir.

The construction of any project will begin only after the EPG site is clear of any identified hazardous sites. All cleanup of contaminated sites will be conducted in accordance with the requirements of the Virginia Department of Waste Management. The goal of the remediation is to remove any environmental hazard at EPG.

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Chapter 4.0
CONSEQUENCES OF PROPOSED ACTION

4.1 CAMERON STATION

The closure of Cameron Station and its subsequent reuse may have environmental and socioeconomic effects as described below.

4.1.1 PHYSICAL/CHEMICAL RESOURCES

4.1.1.1 Physiography and Topography

Closure of Cameron Station and subsequent residential and commercial development may affect the physiography of the site because current drainage patterns of the site will probably need to be changed. This is necessary because large portions of the site are currently considered to be in the 100-year floodplain. Alterations to culverts in Cameron Lake may slightly change the relief of the site. Development in the floodplain is regulated by the City of Alexandria.

With 65 percent of the site currently covered with permanent or temporary buildings, redevelopment of the site into mixed residential and commercial use should not significantly alter the general physiography of the site, assuming that Cameron Lake will not be filled or otherwise developed. If the redevelopment of Cameron Station is built in accordance with local floodplain regulations, the physiography and topography should not be significantly affected.

4.1.1.2 Geology and Groundwater

The proposed reuse of Cameron Station as a moderately intense, mixed-use development should not significantly affect geological resources in the area. Because the groundwater level is only ten feet below the land surface in some portions of the installation, large excavations would require continuous dewatering to prevent groundwater infiltration (McMaster, et al., 1984). Assuming that no new construction would occur involving excavations in these areas, no impacts are expected to the shallow groundwater. Because municipal water lines are currently available, it is not likely that groundwater will be used for a water supply by future development.

4.1.1.3 Soils

The soils at Cameron Station have been altered by grading, filling, and development on the site. The potential for erosion at Cameron Station is decreased by its relatively flat topography. However, any building and grading activities at Cameron Station should use best management practices to minimize soil erosion and sedimentation on the site.

4.1.1.4 Surface Water

Simply closing Cameron Station should have no effect on the surface water bodies found on and adjacent to the installation. However, the PA conducted by USATHAMA recommended that Cameron Lake should be further investigated to determine the quality of the water and sediments before releasing the property.

A highest and best use study identified the need for maintaining open space in order to increase the marketability of the site for mixed residential and commercial use (Delta Research Corporation, 1989). Cameron Lake will likely be maintained to provide open space and be redesigned as a sedimentation and stormwater management basin. Therefore, Cameron Lake is unlikely to be affected directly through filling, but indirectly by possible sedimentation from land development activities and changes in the fisheries and wildlife management practices currently overseen by MDW. Possible water quality degradation in Cameron Lake may result as construction activities cause increased sediment in stormwater runoff entering the lake; this can be greatly reduced through the use of best management practices during construction. Construction will adhere to guidelines outlined in the *Virginia Erosion and Sediment Control Handbook.*

If redevelopment of the site results in an increase in impervious surfaces, water quality in Cameron Lake may be affected by increased inputs of oil, and sediment associated with overland flow from paved surfaces. Impacts to Backlick Run, Holmes Run, and Cameron Run are likely to be less than those to Cameron Lake because Cameron Lake should act as a retention and settling basin for waterborne sediments.

4.1.1.5 Climate and Air Quality

Base closure and redevelopment of Cameron Station should not significantly affect the climate of the local area or region; nor will climate significantly affect the post's potential for redevelopment and reuse after closure.

The closure of Cameron Station should slightly improve the air quality in the area, because operations will have ceased. Other effects on air quality that can be expected with reuse of Cameron Station include temporary increases in dust associated with demolition of the existing buildings and construction of new buildings on the site. Redevelopment will affect air quality because of emissions of carbon monoxide and suspended particulates from construction equipment and fugitive dust from construction activities.

Although the final reuse of Cameron Station is not determined at this time, it is likely that traffic to and from the site will increase over the preclosure traffic volume, and increases in carbon monoxide and suspended particulate emissions will ensue. In contrast to current impacts associated with the Cameron Station operation, the magnitude of these impacts will depend on the final development of the property.

4.1.2 BIOLOGICAL RESOURCES

Because of the developed nature of Cameron Station and its lack of biological resources, no significant impacts are expected as a result of base closure or subsequent redevelopment and reuse. The waterfowl currently using Cameron Lake will likely continue to use the lake or relocate to other waterbodies nearby.

4.1.3 SOCIOECONOMIC CONDITIONS

Socioeconomic impacts of the proposed BRAC actions have been determined by the Institute for Water Resources (IWR) using the Economic Impact Forecast System (EIFS). The outputs of the EIFS model are discussed here in terms of changes (losses or gains) within the region where a realignment-associated installation is located. Impacts (regional losses or gains) associated directly with alignment actions are considered to be primary impacts. Primary impacts include the changes in the following parameters: personnel employed at the installation and their salaries; procurement; and the initial expenditures of realignment-associated construction. Secondary impacts are those effects induced by the initial (primary) impact; for example, a decrease (change) in the regional demand for goods and services that is associated with a regional decrease (change) in the number of people earning wages and salaries. In this case, the change (decrease) in demand is the secondary impact that was induced by the primary impact, which is the change (decrease) in the number of actual or potential purchasers (persons earnings wages and salaries). Total impacts for a region include all of the primary and secondary impacts within the region. The primary and secondary regional socioeconomic impacts of the BRAC actions include the following:

- There will be a net loss of approximately 329 permanent positions[1] (260 civilian and 69 military) in the region, precipitating an annual $12.3 million decrease in total regional wages and salaries. The number of people holding second jobs and the number of working dependents is expected to increase by the equivalent of 42 full-time positions and their wages will increase by $0.5 million.

- The total decrease in regional purchasing power from all sources will be offset by nearly $200 million in realignment-associated construction and by $34.1 million in one-time expenditures.

- A net total of approximately 215 employees (148 civilian and 67 military) are expected to leave the region because of the Fort Belvoir realignment. The actions are expected to result in a 594-person decrease in regional population. The total decrease in regional population will include a decrease in persons living off post and a decrease in children attending

[1]All numbers for acreage, square footage, and personnel within this EIS are subject to fluctuations and are therefore approximate.

public schools. In addition, there will be a decrease in the total number of occupied housing units within the region.

- The region's general economic activity (i.e. sales, employment, and income) will increase because of the positive effects of BRAC-related construction and one-time expenditures, although demographic changes will be negative. The socioeconomic effects of these actions are not significant to the affected region (IWR, 1990).

- The expected changes in population, employment, income, and sales volume within the region are expected to represent approximately 0.02%, 0.02%, 0.07%, and 0.2% of their 1987 levels, respectively (IWR, 1990).

4.1.3.1 Land Use

Cameron Station is scheduled for closure in 1995. Upon closure, the land at Cameron Station may lay idle until it is reused. It is possible that other federal agencies, state or local governments may acquire the property for their use. The Alexandria City Council has zoned the property for mostly residential use, with some commercial and open space.

4.1.3.2 Population

Cameron Station is scheduled for closure in 1995, affecting a total of approximately 3,949 personnel (3,630 civilian and 319 military). Of that total, 3,835 people (3,518 civilian and 317 military) are expected to be transferred to Fort Belvoir, Fort Myer, or Fort McNair, all of which are located within the region. Two military and 112 civilian positions will be eliminated. It is assumed that the people holding these positions will remain in the region. The closure of Cameron Station, therefore, will produce no change in regional population.

4.1.3.3 Housing

The transfer of positions within the region, principally to Fort Belvoir, is not expected to result in a change of residence for the affected personnel, but rather a change of commuting pattern. None of the affected personnel live on Cameron Station. Fort Belvoir is located approximately 12.5 miles south of Cameron Station, Fort Myer approximately five miles to the west of Cameron Station, and Fort McNair is approximately six miles north of Cameron Station. Transfer of personnel from Cameron Station to installations within the region, therefore, is not expected to affect the supply or demand for local housing.

Proposed reuse plans for Cameron Station include mixed-use development with single-family detached and townhouse units with a density of 6 to 12 units per gross acre. Housing demand in the City of Alexandria is regarded as strong, more so for town-houses than for single-family detached units.

4.1.3.4 Employment

Closure of Cameron Station will result in the elimination of 112 civilian positions and two military positions.

4.1.3.5 Income

The number of permanent-party military personnel will decrease by 319 and civilian personnel will decrease by 3,630. None of the affected military personnel live on post. It is estimated that military wages and salaries will decrease by $9.9 million and civilian wages and salaries will decrease by $157.4 million. Second job income is expected to decrease by $35.4 million (IWR, 1990). The elimination of 112 civilian positions and two military positions at Cameron Station represents a loss of $4.9 million in annual wages and salary in the immediate area.

4.1.3.6 Construction and One-Time Expenditures

A one-time expenditure of $9.8 million is expected because of the closure of Cameron Station. All one-time expenditures will occur during the construction period of 1991 through 1994. The total primary and secondary impacts of realignment-associated one-time expenditures will result in the regional sales volume increasing by $5.3 million, regional employment increasing by 58 person-years and regional income increasing by $1.0 million.

Realignment-associated construction expenditures will be $15.4 million. All construction impacts will occur during the construction period of 1991 through 1994. The total primary and secondary impacts of realignment-associated construction will result in the regional sales volume increasing by $7.2 million, regional employment increasing by 124 person-years, and regional income increasing by $2.6 million.

4.1.3.7 Community and Army Facilities

As personnel are reassigned, the demand for community facilities typically affected by the normal operation of the installation will diminish. Because the relocations are relatively close to Cameron Station however, no significant drop in use of schools, churches, shops, and similar community facilities is expected. The timing of increased demands which are expected when the property is redeveloped, is unknown at this time, as is the actual magnitude of the redevelopment.

Cameron Station has provided commissary and PX facilities for a large active-duty and retired military population that resides or is stationed in the region. The relocation of these facilities to Fort Belvoir and to Fort Myer may cause longer commutes for those personnel and their dependents in the immediate vicinity of Cameron Station. Those affected will either adjust their travel for shopping at the new commissary and PX or will frequent nonmilitary stores. Patrons residing closer to Fort Myer and Fort Belvoir will have their travel reduced after the commissary and PX are relocated.

Most of the other Army community facilities at Cameron Station will be relocated to Fort Belvoir or Fort Myer. No significant impacts are anticipated. The class VI store at Cameron Station, however, will not be relocated. This could result in the loss of up to $1 million in morale, welfare, and recreation funds for MDW Installations.

4.1.3.8 Traffic and Transportation

4.1.3.8.1 Year 1995. Access to a redeveloped Cameron Station will need to be analyzed in detail upon the preparation of a specific site plan, especially for access to and egress from the site. The future owner or developer and the state and local highway departments should coordinate their plans to provide transportation improvements for the site-specific reuse, if required.

As expected, the vacating of the Cameron Station site as part of BRAC will result in some temporary reduction in traffic volumes in the study area.

4.1.3.8.2. Year 2000. Traffic generated by the proposed level of private redevelopment of Cameron Station warrants the addition of a third left turn lane from westbound South Pickett Street to Van Dorn Street (Figure 4-1). The existing interchange access at Duke Street may require modification by means of ramp reconstruction or signalization to eliminate the weave between Cameron Station egress and access points on eastbound Duke Street (Figure 4-1).

4.1.3.8.3. Year 2010. The requirements for the year 2000 (above) will meet the needs of the year 2010.

4.1.4 CULTURAL RESOURCES

4.1.4.1 Historic Resources

Pursuant to Section 106 of the National Historic Preservation Act, 36 CFR 800, and a Programmatic Agreement with the Advisory Council on Historic Preservation and the National Conference of State Historic Preservation Officers, the Army will consult with the Virginia SHPO and the Alexandria City archeologist and execute a Memorandum of Agreement (MOA) stipulating what actions will be carried out to avoid or mitigate adverse effects of disposal on archeologic and historic resources. In order to comply with the MOA, the Army will complete the actions detailed below.

- Review the history of Cameron Station from its inception at another site in 1919 to the present using files from the Army, SHPO, the city archeologist, National Archives, and the Library of Congress

- Consider the history of Cameron Station in the context of military activities in Washington, D.C., southern Maryland, and northern Virginia

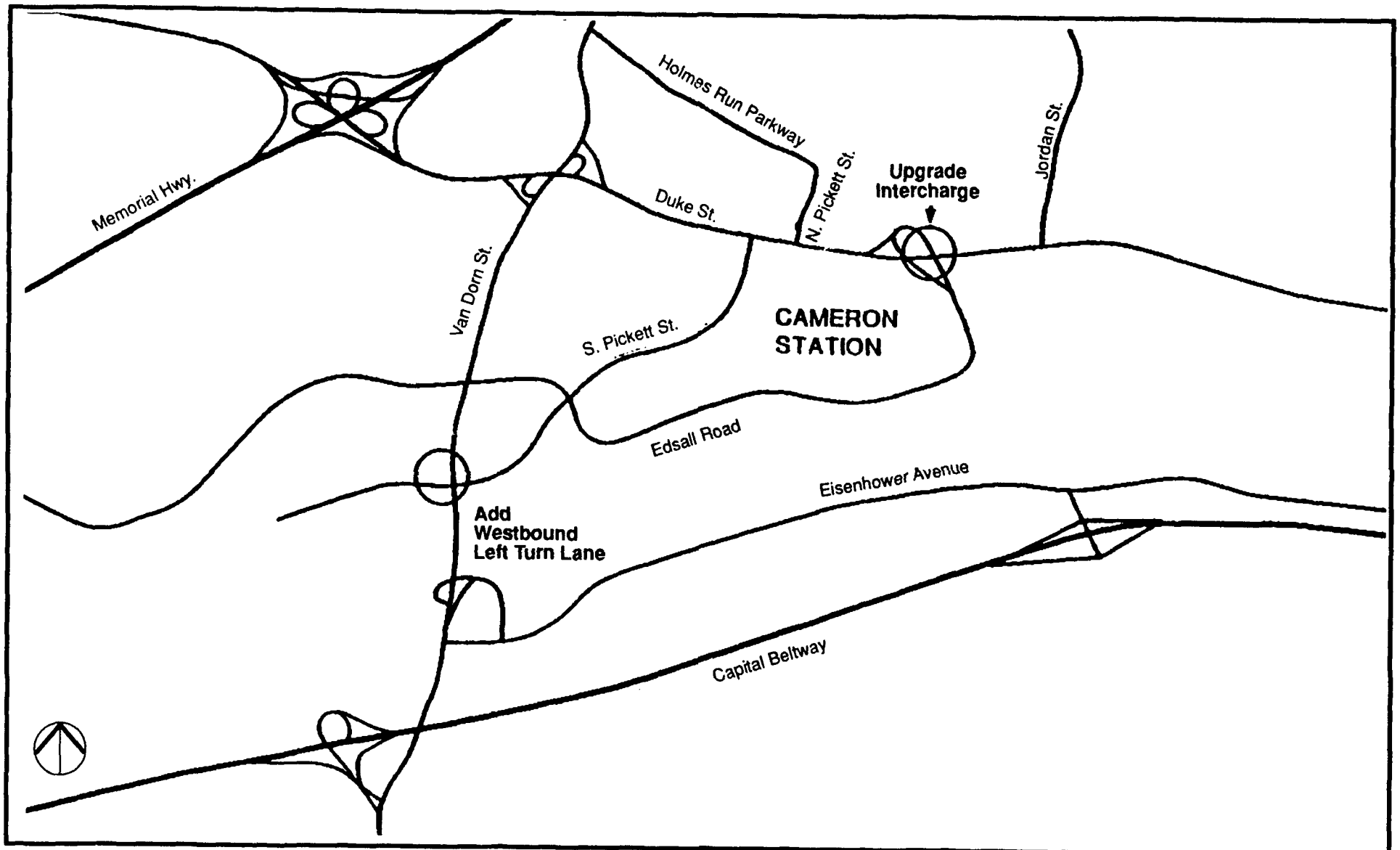


Figure 4-1
Year 2000 and 2010 Improvements to Mitigate Cameron Station Development Impacts

- Provide a summary of this history, with emphasis on:
  - The role of Cameron Station in the conduct of World War II
  - The role of Cameron Station in the conduct of the Korean conflict
  - The role of Cameron Station in the conduct of the Vietnam War
  - The role of Cameron Station in other activities of the U.S. Army in the Washington, D.C., area since 1941
  - The functions of key buildings and structures at Cameron Station in carrying out the post's various roles during the course of history
  - Determine which of these structures appear to have such a great historical significance that they should be considered for long-term preservation

4.1.4.2 Archeological Resources

Cameron Station is located at the confluence of two watercourses on the floodplain of the Potomac River, and thus is an area of high potential for prehistoric and early historic archeological sites. It appears that much of the area of the post has been covered with fill presumably during the construction of the post in 1941; this fill may cover significant archeological sites. However, previous grading, building construction, and other activities may have destroyed such sites. The Army will address potential archeological resources at Cameron Station as follows:

- Review currently available predictive models for the region, and on the basis of these models outline general areas where prehistoric and early historic sites might be expected at Cameron Station
- Study the deeds, censuses, tax rolls, historical maps, and other documentary sources relating to the property to determine historical land use before 1941, and from these data predict where archeological sites might be found
- Review available data from the Army, Virginia SHPO, city archeologist, and others on Cameron Station's soils, as-built plans, and descriptions of grading and construction work, as well as other information pertinent to the modification of the land surface during and after 1941. Information will also be collected, by interviews, from former Cameron Station employees known to either the Army or the city archeologist in order to identify areas where pre-1941 land surfaces exist and are not likely to be under fill

- Identify locations where:
  - Modeling predicts that archeological sites may be preserved under fill
  - Modeling predicts that such preservation is unlikely; and subsurface testing is thought to be needed to test these predictions
- Consult with the Virginia SHPO, city archeologist, and other parties regarding the need for and design of subsurface sampling programs

4.1.5 HAZARDOUS MATERIALS

A PA has been completed for Cameron Station. Results reported by USATHAMA (1989) recommend additional studies. The Army is conducting comprehensive studies to investigate all areas of potential concern. The Army will remediate problem areas as required.

On the basis of available information, Cameron Station cannot be considered an imminent or substantial threat to the health of the surrounding populations or the environment. However, significant potential does exist for contaminant releases. Before the property is sold, the following specific actions are being taken:

- Investigate Cameron Lake water and sediments
- Investigate the area around the pesticide storage facility (Building 30) to locate contaminated soil
- Leak-test underground storage tanks (USTs) and sample soil in the vicinity of the tanks that have not already been tested under the current program
- Sample oil-stained areas near motor pool facilities
- Test samples of soil taken from nonregulated transformer locations for PCBs
- Sample the landfill area in the southeast corner and test for priority pollutants
- Conduct a survey to characterize, quantify, and assess risks associated with asbestos

These studies will determine the risks that may be associated with redevelopment of the site. The Army will continue to investigate USTs and bring them into compliance. Asbestos will be identified, risks evaluated, and remedied where imminent health threats exist. Air emissions from the Army operations will cease, discharges to sanitary

sewers will cease, and drum storage operations will stop when Cameron Station is closed. PCB risks associated with regulated transformers have been evaluated and are being remedied as necessary. Previous pesticide use will be evaluated and remedied. Previous landfill operations and past surface water and sediment impacts to Cameron Lake, and the surrounding shoreline, including Cameron Run, Backlick Run, and Holmes Run will be assessed. Drums and other debris previously dumped in Cameron Lake will be investigated and removed, if necessary. Water and sediment samples from Cameron Lake, as well as groundwater samples from other areas of the post, are being tested to determine if contaminants are present. All of these actions will be coordinated with the community and regulatory agencies.

Table 4-1 presents a summary of impacts expected from the closure of Cameron Station.

4.2 FORT BELVOIR

4.2.1 BRAC ACTIONS

The realignment of ISC from Fort Belvoir to Fort Devens is not expected to have any significant effect on any resource at Fort Belvoir and will not be discussed further in this section.

4.2.1.1 Physical/Chemical Resources

4.2.1.1.1 Physiography and Topography. None of the alternative sites for any of the proposed BRAC projects is expected to have any significant effects on physiography and topography because non-water-dependent structures will be sited outside the limits of Resource Protection Areas (RPAs) as required under Fairfax County's RPA definition. This requirement limits the available buildable area on BRAC 1, Alternative 2 and BRAC 8, Alternative 2 to elevations above the 125-foot contour. Most of the development sites are located in areas that have already been disturbed because of other facilities or intensive training activities. Buildings will be sited to minimize grading and designed to complement the existing topography. The use of existing structures will also minimize the effects to physiography and topography.

4.2.1.1.2 Geology and Groundwater. Because no significant subsurface activities are planned, construction of the new facilities at any of the proposed alternative sites should not have any significant effect on the geology at Fort Belvoir.

Likewise, because seismic activity is not significant in this region, geological conditions should not affect building design. None of the proposed projects will need wells to supply drinking or process water. The water for these projects will be provided by the FCWA. Fort Belvoir has a supply agreement with FCWA, which will be modified when the demand for water begins to increase at the installation. Water and sewer lines will be constructed to connect the proposed projects that require potable water to the

Table 4-1
SUMMARY OF EFFECTS OF CLOSURE ON CAMERON STATION

Resource	Effect
Physiography & Topography	No significant effects expected.
Geology and Groundwater	No significant effects expected. However, reuse could be affected by the 100-year floodplain that encompasses 97% of the site.
Soils	No significant effects expected.
Surface Water	Implementation of best management practices during redevelopment will minimize potential effects.
Climate & Air Quality	No impact
Vegetation	No impact
Wildlife	No impact
Wetlands	No impact
Aquatic Biota	No impact
Threatened & Endangered Species	No impact
Land Use	The land use at Cameron Station will change under the proposed reuse scenario.
Population	3,835 positions will be realigned as part of the closure of Cameron Station. However, this is not significant because the personnel shifts occur within the same region. The loss of 112 civilian and 2 military positions is not considered to be a significant regional impact.
Housing	No significant effects expected.
Employment	3,949 positions will be lost when Cameron Station is closed. However, all but 114 of these positions are being realigned to other posts within the region and no significant effects are expected.
Income	No significant effects expected because the personnel being realigned are expected to remain in the region.
Community and Army	No significant effects expected because additional facilities will be constructed to replace those eliminated.
Traffic & Transportation	The closure should reduce traffic volumes somewhat. Additional traffic analysis will be needed when a specific reuse plan is developed.
Cultural Resources	NHPA Section 106 and 110 coordination will be completed by the Army before disposal.
Hazardous Materials	Contamination assessments are being conducted. Remediation will be completed as necessary.

*All numbers for personnel in this table, although accurate at the time of this writing, are subject to slight fluctuations and are therefore approximate.

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existing water supply system. Therefore, there will be no effect on the quantity of groundwater at Fort Belvoir.

Groundwater quality can also be affected by surface development activities. Facilities where fuels or hazardous materials are handled can be responsible for affecting groundwater if those materials are accidentally spilled where they cannot be contained and collected. Some of the proposed development projects, like BRAC 9, which will have USTs for gasoline, and BRAC 8, which will use hazardous materials (e.g., solvents), albeit in small quantities, will be required to comply with Fort Belvoir's hazardous materials program. The program is administered by DEH to comply with federal and state regulations.

4.2.1.1.3 Soils. A number of facilities or actions have been proposed for soils that may present building constraints. The obstacles are in the form of regulatory constraints related to the Chesapeake Bay Preservation Act. The soil properties of concern include reduced iron content, high water tables, and steep slopes, all of which may also present physical constraints to development. Hydric soils generally indicate the presence of wetlands and high water tables suggest the potential for wetland areas. According to the Chesapeake Bay Preservation Act, development is not allowed in wetland areas that are connected to waters draining into the Chesapeake Bay in Virginia. In fact, the Chesapeake Bay regulations require a buffer around these wetland areas. A buffer is also required along steep slopes ($\geq$15%) that are adjacent to wetland and deep-water areas within the Chesapeake Bay drainage basin. The only exceptions within the RPA are for water-dependent facilities. Table 4-2 identifies potential developmental constraints that will be considered in the site layout and design process for each alternative for each of the BRAC projects. Further field analysis may be required to accurately determine if these proposed facilities are indeed affected by these physical conditions and require special engineering, such as dampproofing foundations. However, final site selection is not dependent upon the completion of this analysis. The constraints will be analyzed during the detailed site layout and design phase of each project on the selected site in order to minimize impacts to the RPA and assure compliance with the Chesapeake Bay Preservation Act.

4.2.1.1.4 Surface Water. None of the alternative sites for BRACs 4, 5, 6, 7, 9, and 10 will effect surface water or be effected by RPAs and, therefore will not be discussed further in this section. Control and management of stormwater will be required at all projects. In areas developed within the resource management area, best management practices (BMPs) will be used to control stormwater and sediments in compliance with the *Virginia Erosion and Sediment Control Handbook*. All stormwater management facilities will be designed and permitted in accordance with all applicable regulations. The final designs for each BRAC action will be incorporated into the postwide stormwater management plan currently being developed.

The northern and western boundaries of the preferred alternative for BRAC 1 follow the edge of a plateau bordering a stream. The RPA requirement for this stream constrains the site somewhat (Figure 4-2). In addition, an ephemeral stream partially

Table 4-2
DEVELOPMENT CONSTRAINTS FOR PROPOSED BRAC PROJECT ALTERNATIVES AT FORT BELVOIR

Action/Facility	Building Constraint
Headquarters Complex (BRAC 1):	
Preferred Alternative	None
Alternative 2	Soil survey incomplete, subsurface investigation required.
Alternative 3	None
Industrial Park (BRAC 2):	
Preferred Alternative	100% high water table
Alternative 2	10% hydric soil/90% high water table
BRAC Roads, North (BRAC 3):	
Preferred Alternative	7% hydric soil/19% high water table/11% steep slope
Alternative 2	50% high water table/10% steep slope
BRAC Roads, South (BRAC 3):	
Preferred Alternative	5% high water table
Commissary Warehouse Addition (BRAC 4):	
Alternative 1	25% high water table
Alternative 2	None
Post Exchange (BRAC 5):	
Preferred Alternative	100% high water table
Alternative 2	None
Commissary (BRAC 6):	
Preferred Alternative	None
Alternative 2	None
Material Research Facility (BRAC 8):	
Preferred Alternative	15% high water table
Alternative 2	75% high water table, 15% steep slope
Exchange Branch (BRAC 9):	
Preferred Alternative	None
Alternative 2	40% high water table

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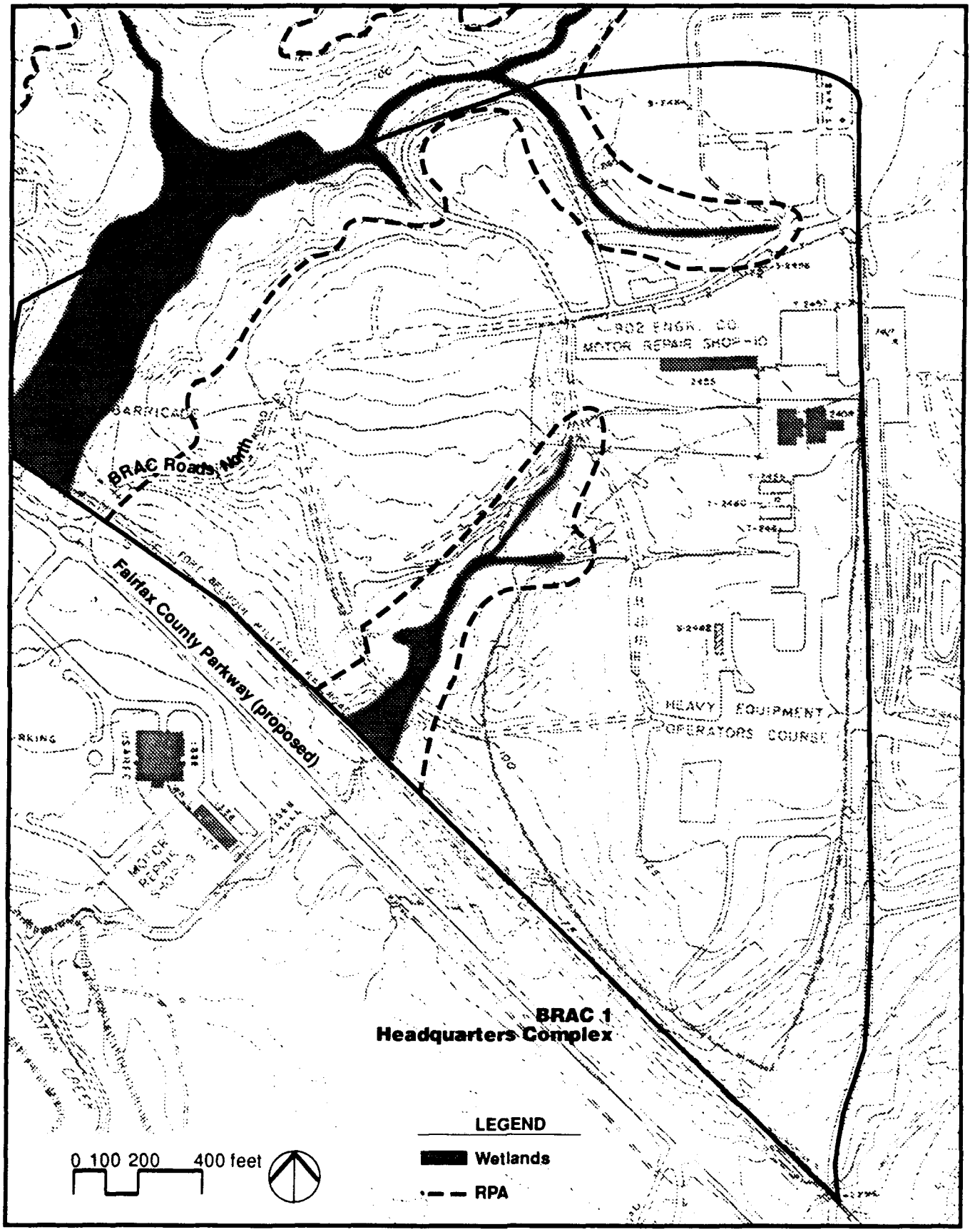


Figure 4-2
BRAC 1, Preferred Alternative
Environmental Constraints

bisects the southwestern portion of the site. Final site layout will need to consider the RPA boundary and all structures should be located outside this area.

BRAC 1, alternative site 2 is virtually surrounded by wetlands and RPAs (Figure 4-3). These features constrict the size of the site, considerably limiting the buildable area to elevations greater than 125-feet MSL. In addition, substantial amounts of bridging will be required to minimize the effects of the access roads on the wetlands and streams that bound the site. The construction and placement of these mitigation measures for this site would have a temporary negative effect on water quality by the increased amounts of suspended solids in the water. In addition, the oils and greases present in the stormwater runoff from the access roads could also negatively affect the existing water quality.

BRAC 1, alternative site 3 will not have any effect on surface water quality.

The preferred alternative for BRAC 2 will neither affect surface waters nor be affected by RPAs.

Alternative 2 for BRAC 2 contains an ephemeral stream that bisects the site limiting the area available for construction (Figure 4-4). The RPA buffer required for the stream would necessitate the industrial park being designed in two parts to avoid affecting either the RPA or the stream. Even with this design option a bridge or culverting would be required to connect the two portions of the site.

The preferred alternative for BRAC 3, North, will require six stream crossings and will effect the RPA's surrounding the streams (Figure 4-5). While road crossings are allowed within the RPA, the regulations recommend that clearing and grading be limited to the minimum needed to complete the project. Bridging and oversized culverts will be incorporated into the final design to minimize the effects of this project on the streams and surrounding RPAs. Construction activity at stream crossings has the potential to increase the levels of suspended sediments, nutrients, and other contaminants associated with those sediments. These effects are temporary and can be minimized through the use of BMPs as prescribed by the Virginia Soil Conservation Service. Likewise, surface water runoff from construction sites can affect water quality in streams.

Alternative 2 for BRAC 3, North, will only require three stream crossings because it is a much shorter road segment (Figure 4-5). However, this road is much shorter than the preferred alternative and would remove Woodlawn Road as an access point to the preferred alternative for BRAC 1.

The preferred alternative for BRAC 3, South, will require a maximum of two stream crossings (Figure 4-6). The final alignment may be moved south so only one stream crossing would be required. Oversized culverts will be used to minimize the effects of this project on the stream and RPAs. As with BRAC 3, North, BMPs will be used to minimize sedimentation.

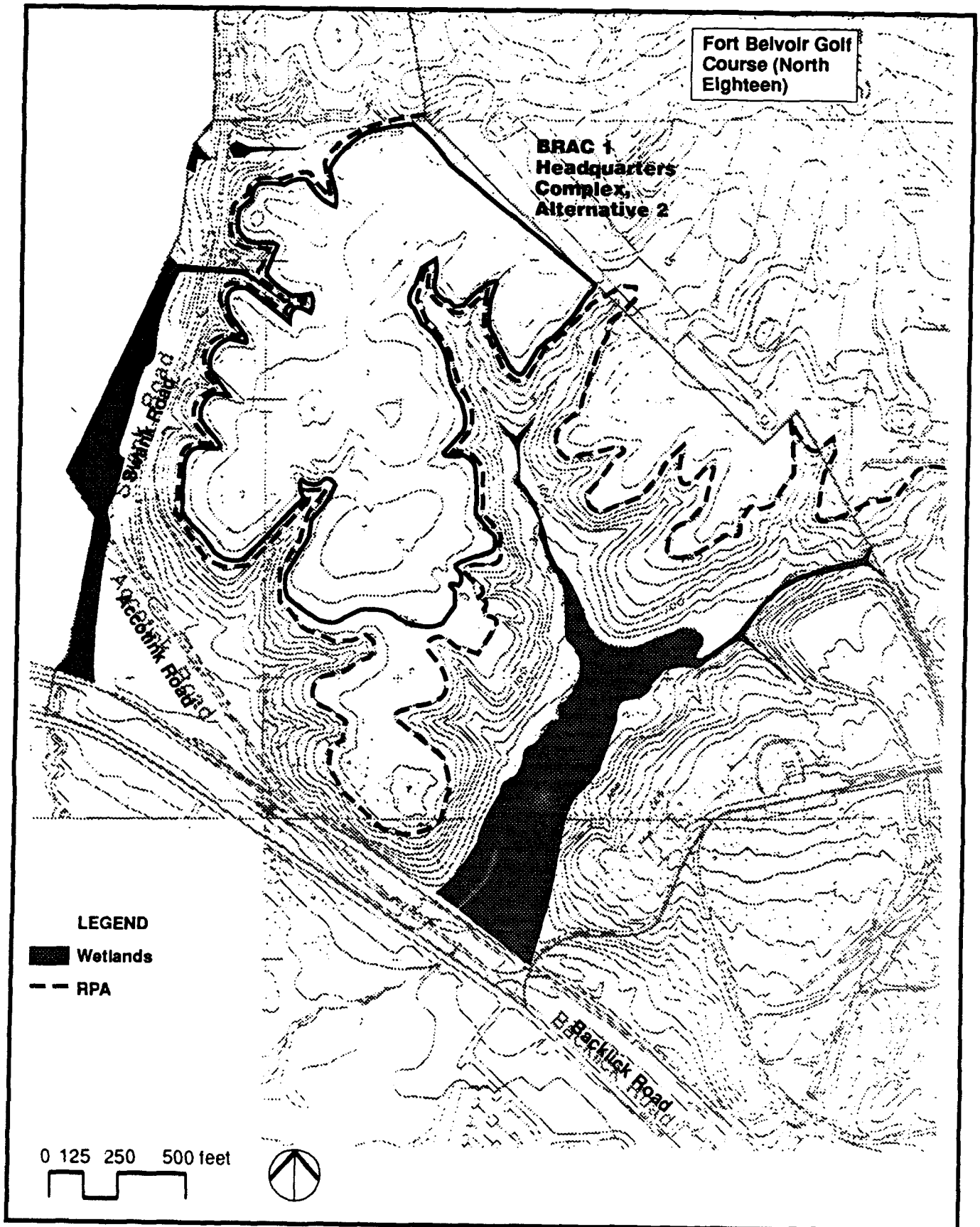


Figure 4-3
BRAC 1, Alternative 2
Environmental Constraints

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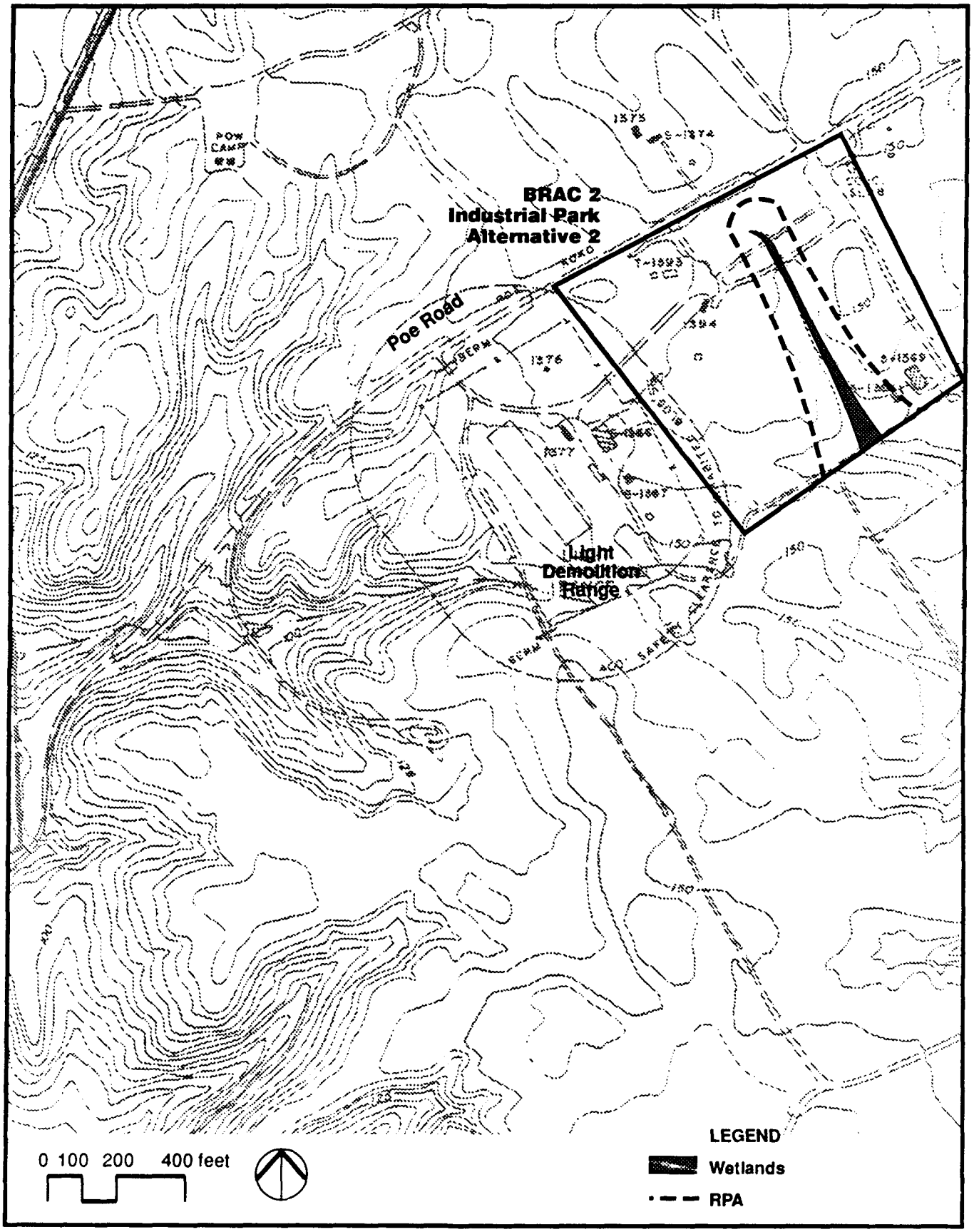


Figure 4-4
BRAC 2, Alternative 2
Environmental Constraints

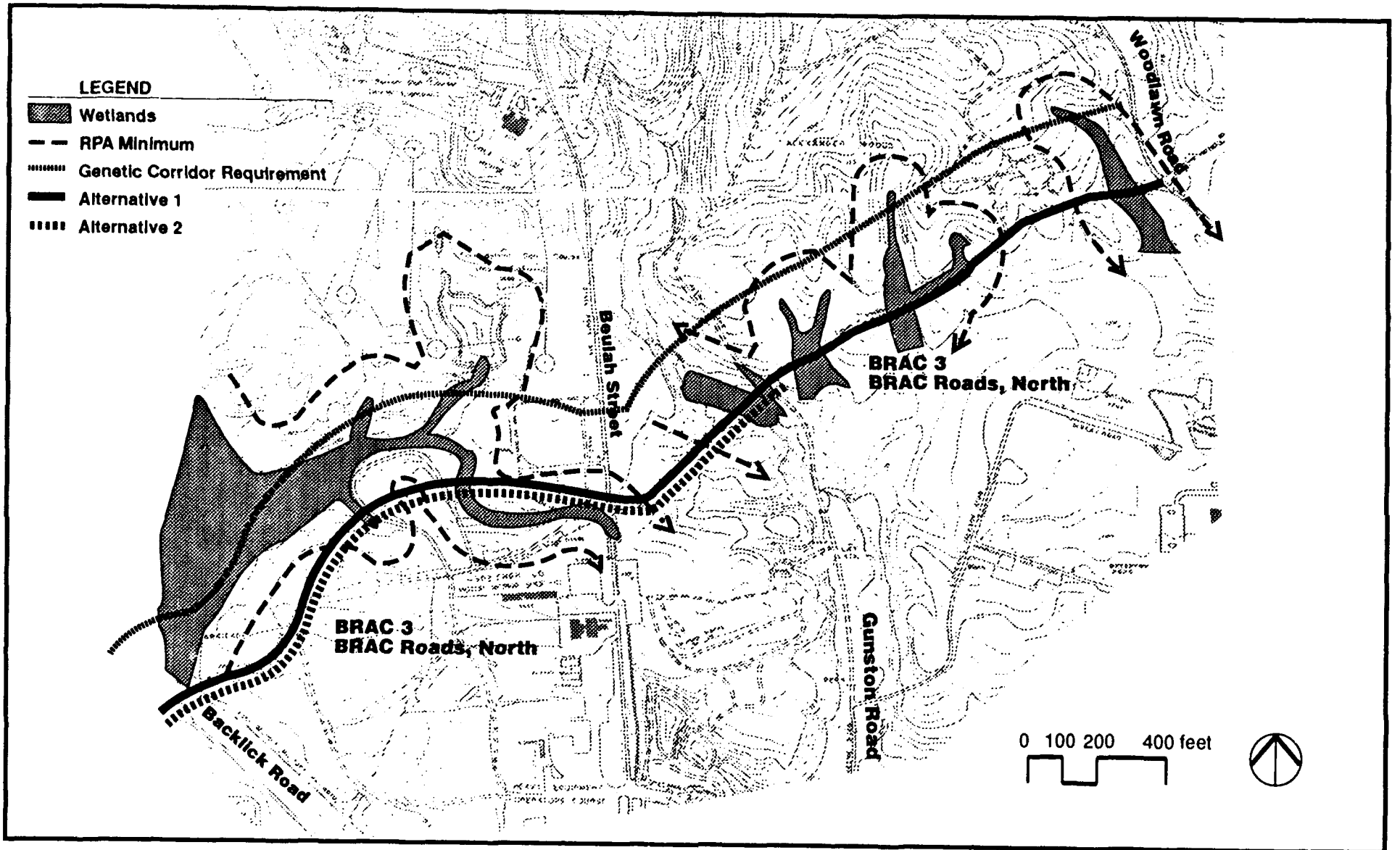


Figure 4-5
BRAC 3, Preferred Alternative and Alternative 2
Environmental Constraints

ENVIRONMENTAL IMPACT STATEMENT
Comprehensive Base Realignment/Closure
and Fort Belvoir Development
Arlington and Fairfax Counties and the City of Alexandria, VA

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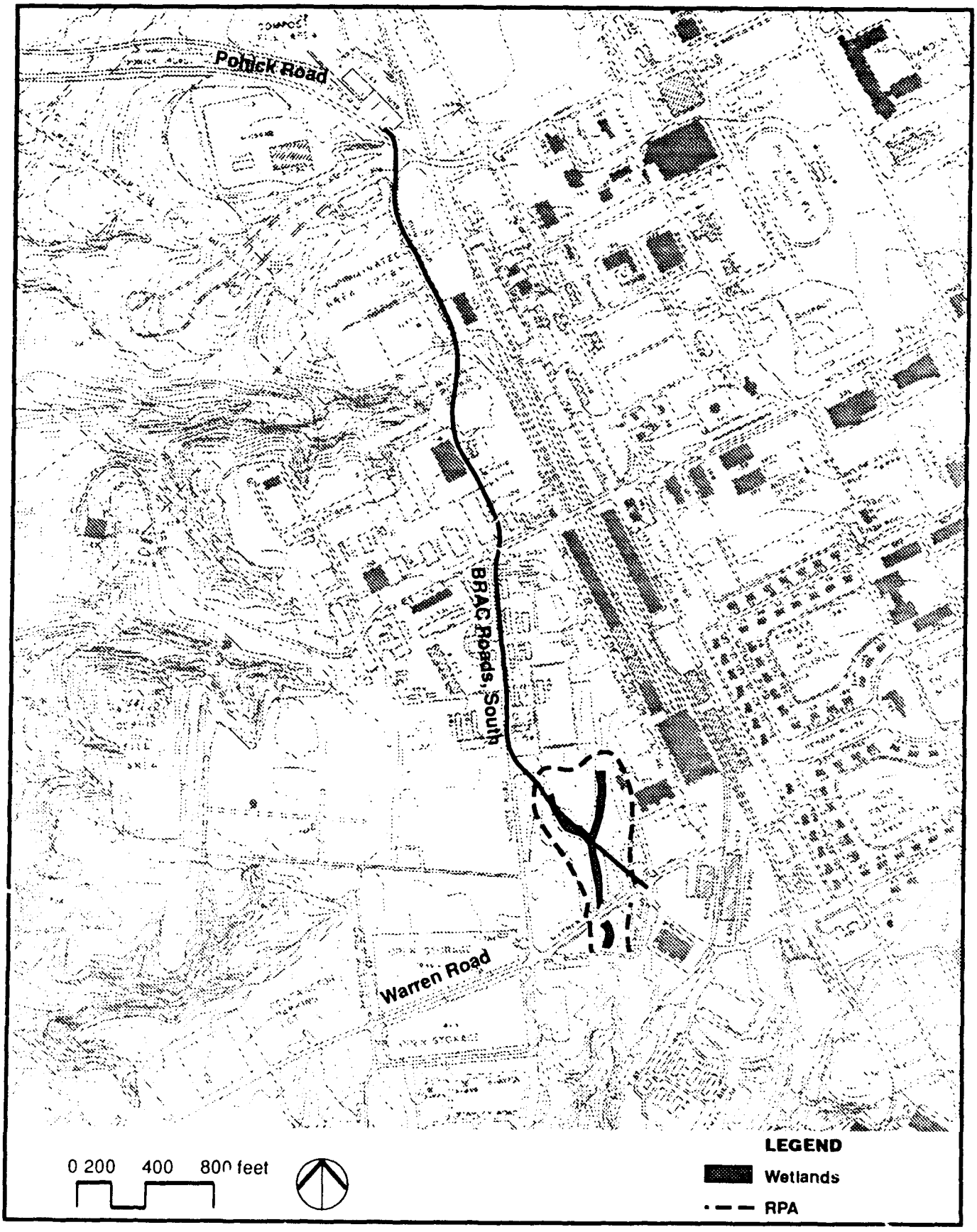


Figure 4-6
BRAC 3, South,
Preferred Alternative
Environmental Constraints

The preferred alternative for BRAC 8 will not affect either surface waters or RPAs.

Alternative 2 for BRAC 8 is restricted to elevations above 125-feet MSL to avoid encroaching on the RPAs that are required for the streams and wetlands that bound the site (Figure 4-7).

4.2.1.1.5 Climate and Air Quality. The construction and relocation of the new facilities and activities is not expected to have any effect on climate, nor is climate expected to have a significant effect on the activities regardless of the alternative site selected for any of the BRAC projects.

As Fort Belvoir will experience a net increase of approximately 3,856 personnel because of the BRAC actions, the influx of vehicles into the area will probably have a slight effect on local air quality. Carbon monoxide and O_3 levels within the local area may increase slightly because of the increased traffic on Fort Belvoir. Carpooling is actively encouraged at Fort Belvoir and public transportation is available. These factors could reduce somewhat the actual number of new commuter vehicles in the area.

Earthmoving, which will occur at each of the proposed construction sites, will comply with erosion and sediment control BMPs (e.g., wetting sediments) to reduce the potential for dust blowing at construction sites. These BMPs are required in order to protect adjacent vegetation and surface waters as well as existing buildings and people working on the installation.

The laboratories associated with the Material Research Facility, which are planned for BRAC 8, use a variety of volatile chemicals (e.g., acetone, methanol, and isopropanol). The laboratory facilities will be designed to control the minor air emissions from these chemicals. Vented hoods and exhaust fans will be installed to control the interior air quality; all fans and hoods will be part of the building's heating, ventilation and air conditioning system. The technology used will include best available control technology. Any emissions from the building will comply with federal and state air quality regulations.

4.2.1.2 Biological Resources

4.2.1.2.1 Terrestrial Biota. Development of either the preferred alternative or Alternative 2 for BRACs 1 and 3 could potentially affect biological resources and are discussed in detail below. The alternatives for the remaining construction projects, however, are not expected to have significant effects on biological resources because they are located in areas that provide little habitat of value because of previous disturbance and will not be discussed further in this section.

4.2.1.2.1.1 Wildlife Genetic Corridor. Both the preferred alternative and Alternative 2 for BRAC 3 could have a detrimental effect upon species attempting to disperse across this roadway. The effect of Alternative 2 would be less than the preferred alternative because it is a smaller section of road. Small mammals are reluctant to cross paved roads (Giger, 1973; Oxley, et al., 1974; Joule and Cameron, 1974) or even gravel roads

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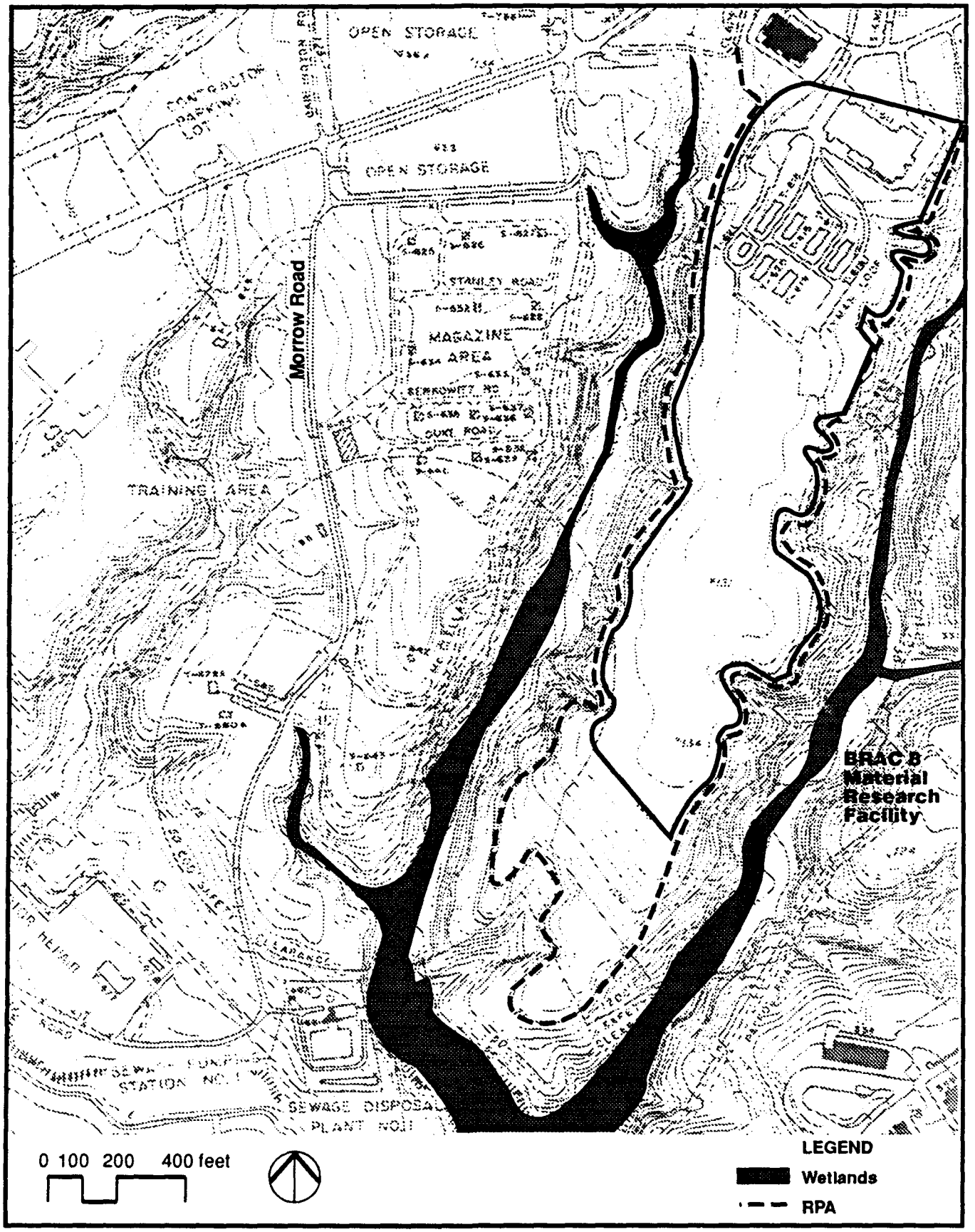


Figure 4-7
BRAC 8, Alternative 2
Environmental Constraints

(Meserve, 1971; Kozel and Fleharty, 1979; Wilkins, 1982; Swihart and Slade, 1984). Some species are even reluctant to cross lightly worn dirt roads (Swihart and Slade, 1984). This seems to indicate that roadways can significantly inhibit the movements of these species.

Underpasses and culverts have been shown to be heavily used by mammals avoiding contact with open space (Lalo, 1989). Reed, et al. (1975) and Carbough, et al. (1975) showed not only that deer would use 9 x 9 x 90-foot box culverts, but could be funneled towards them using topography, guard rails and chain-link drift fences. This substantially reduces mortality during road crossings. At Fort Belvoir, most of the road kills occur from September through December. In 1988, 11 deer were killed and in 1989, 9 deer were killed (Ernst, et al., 1990 and S. Belfit, personal communication).

Large numbers of amphibians and reptiles are also killed each year attempting to cross roadways (Dodd, et al., 1989). In England and Europe, construction of underpasses at popular crossing points for critical populations has shown these tunnels to be successful in allowing amphibians to move to and from breeding areas (Diesener and Reicholf, 1986; Langton, 1987; Esterik, et al., 1989; and Banks, 1987).

To minimize impacts to the corridor along the BRAC Roads, underpasses and box culverts as a means of allowing dispersal, will be evaluated for the final design for the preferred alternative. Topography and six-foot-high, chain-link drift fences could also be used to funnel species toward the underpasses and culverts to maximize their use and minimize road kills. A 250- to 300-foot buffer will also be maintained on the north side of BRAC Roads where practicable.

Construction of BRAC 1 at either the preferred alternative or Alternative 2 will cause an increase in the existing constriction of the genetic corridor at the site. Dispersing animals will be restricted to the woodlands associated with the stream valley to the west of the property line after construction is completed. Development at the preferred alternative site will be restricted to areas south of the BRAC Roads, and a 250- to 300-foot buffer will be retained to the north of the development site to maintain the corridor.

4.2.1.2.1.2 Vegetation. While most of the BRAC sites will require some clearing of indigenous vegetation, because of its size and scope, the preferred alternative for BRAC 1 will require the largest amount of clearing. However, the past use of the site as a heavy-equipment training course has disturbed or removed approximately 70 percent of the original native vegetation. The present vegetative cover at the preferred alternative consists primarily of early successional species. The clearing required for the BRAC projects is not expected to significantly affect the amount of vegetative cover or diversity at Fort Belvoir. To the extent possible, native vegetation will be saved. This could provide a vegetative screen, tree islands for parking lots, as well as habitat for wildlife.

For each of these projects, Fort Belvoir will comply with the recently passed Fairfax County tree ordinance by maximizing canopy areas retained at development sites. As

part of a continuing effort of post beautification, trees have been planted annually throughout the post under Fort Belvoir DEH's natural resource program.

4.2.1.2.1.3 Wildlife. Although the projects discussed in Section 2.4.2.3 will have an effect on the movements of terrestrial species, none of the proposed disturbances at any of the preferred or alternative sites for any of the BRAC projects will significantly affect habitats at Fort Belvoir. Animals displaced by construction should relocate into the remaining woodland. Competition for food and territories could stress the populations; however, and road kills could increase, especially after BRAC Roads are improved.

The goals of the *Fort Belvoir Natural Resources Management Plan* (April, 1983) should include studying and monitoring the post's resources so that plans for growth will accommodate the post's mission. To that end, it will be important to protect key wildlife corridors, wetlands, and other sites; water quality; and to manage habitat so that resources are not adversely affected by the post's mission. The plan will be used to manage forest fragmentation to protect species like the barred owl, which require large blocks of forest cover for breeding. Wildlife mitigation to offset habitat losses could include cavity- and nest-tree improvement, creation of brush shelter, landscaping with important wildlife plants, and stormwater management practices.

4.2.1.2.1.4 Game Species. The mitigation measures outlined in Section 4.2.1.2.1.1 will minimize road kill mortality, and as a result, none of the proposed actions at any of the preferred or alternative sites should have a significant effect on whitetail deer.

4.2.1.2.2 Wetlands. Wetlands are protected by the Clean Water Act, and impacts to this resource should be minimal. Jurisdictional wetland delineations will be completed for all BRAC sites before final site layout and design are completed. In the event that wetlands may be impacted, Fort Belvoir will use the principles of the MOA between the U.S. Army Corps of Engineers and the EPA concerning the guidelines in the Clean Water Act, Section 404(b)(1), for the determination of mitigation. Avoidance and minimization of wetlands impacts need to be addressed before any mitigation is deemed appropriate for compensating for unavoidable adverse effects.

Virginia enacted the Chesapeake Bay Preservation Act in 1989. This act mandates that 27 counties in Virginia, including Fairfax County, implement at minimum, the state regulations. Fairfax County expects to have its ordinances in place in early 1991. The ordinance would require a 100-foot vegetated buffer between construction disturbance and components designated as RPAs. The limits of the RPA are defined by the following natural features:

- Tidal wetlands
- Nontidal wetlands connected by surface flow and contiguous to tidal wetlands or tributary streams
- Tidal shores

- Other lands, which under the provisions of Subsection A of 3.2 of the state regulations, are necessary to protect the quality of state waters

Fairfax County staff have proposed to incorporate steep slopes ($\geq$15%) adjacent to wetlands and tributary streams into the local ordinance. The ordinance will need the approval of the County Board of Supervisors before it can be implemented. Development in the RPA is specifically restricted to water-dependent facilities, passive recreation (paths, boardwalks, etc.), water wells, and historic preservation and archeological activities.

In addition to the RPA requirements, the act also requires that there be a Resource Management Area (RMA) contiguous to the entire landward boundary of the RPA, which can include the following natural features:

- Floodplains
- Highly erodible soils, including steep slopes
- Highly permeable soils
- Nontidal wetlands not included in the RPA
- Other lands, which under the provisions of Subsection A of 3.3 under RMAs, are necessary to protect the quality of state waters

Development in the RMA requires the use of BMPs to control stormwater runoff and downstream sedimentation.

DOD has agreed to comply with these regulations with the issuance of the 1987 Chesapeake Bay Agreement; the *Federal Facilities Strategy*; *Federal Workplan*; issued in July 1988; and an April 1990 memorandum of agreement with EPA to restore the Chesapeake Bay. The MOA includes a list of DOD facilities in the Chesapeake Bay region with a significant potential to affect the Bay's water quality. Fort Belvoir is included on this list. Portions of these documents are included in Appendix E. Detailed wetland delineations will be conducted before the development at any of the sites to avoid affecting the wetlands and in order to accurately map RPA limits. Fort Belvoir will obtain and comply with all required wetland permits. Preliminary surveys indicate that both the preferred alternative and Alternative 2 for BRACs 1 and 3, North, the preferred alternative for BRAC 3, South, Alternative 2 for BRAC 2, and Alternative 2 for BRAC 8 are affected by wetlands and RPAs (Figures 4-2, 4-3, 4-4, 4-5, 4-6, and 4-7). The wetland and RPA boundaries for both the preferred alternative and Alternative 2 for BRAC 3, North (Figure 4-5) are based on the results of the jurisdictional wetland delineation completed for this project.

Although the Army will avoid these wetlands to the extent practicable, examination or preliminary design information indicates that it may be necessary to fill approximately 1.5-acres of non-tidal wetlands to construct the road. The Army will obtain an

Individual Section 404 Permit before construction begins. The Army will also create wetlands at a one-to-one ratio to replace those lost in order to comply with the president's no net loss of wetlands program.

4.2.1.2.3 Aquatic Biota. The preferred alternative and Alternative 2 for BRAC 1 and BRAC 3, North, and Alternative 2 for BRACs 2 and 8 have the greatest potential to affect aquatic biota. However, the preferred alternative for BRAC 1 has less of an effect than Alternative 2; site development will not require bridging and culverts because the stream, which borders the property, can be easily avoided. The location of the stream at Alternative 2 requires that bridging and culverts be used as part of the access roads to the site. The construction and placement of these mitigative measures for the site would have a temporary negative effect on aquatic biota. In addition, the oils and greases present in the storm water runoff from the access roads could also negatively affect the existing aquatic biota.

The preferred alternative for BRAC 3, North, has a greater potential to affect aquatic biota than Alternative 2 because of the greater number of stream crossings required. However, the road will be designed with oversized culverts and bridging as necessary to minimize these effects. The construction of Alternative 2, BRAC 3, North, would not provide the degree of access required for the preferred alternative, BRAC 1, because it eliminates access from Woodlawn Road. This would require that all of the incoming traffic use Richmond Highway, the Fairfax County Parkway, or Beulah Street to access the Headquarters Complex.

The remaining BRAC project sites are upland, and should have a minimal effect on aquatic biota. Water quality can be affected by surface water runoff from development sites. An increase in suspended solids can reduce dissolved oxygen levels, clog respiratory organs, and smother aquatic biota. Effects of site development will be minimized by using BMPs at each project to control stormwater runoff and reduce soil erosion. Sedimentation control will comply with the *Virginia Erosion and Sediment Control Handbook*, and sites will have adequate stormwater management. Compliance with the Chesapeake Bay Preservation Act will also minimize the effects of site development on aquatic biota at those sites containing surface water bodies. Areas developed within the RMA will use adequate BMPs to control stormwater and sediments.

4.2.1.2.4 Threatened and Endangered Species. The preferred alternative for BRAC 3, North, will involve constructing the roads into wood turtle habitat near the intersection of Woodlawn Road. The wood turtle is expected to be elevated to threatened status in Virginia during the 1990 session of the Virginia General Assembly. Site surveys and additional coordination may be required with the appropriate state agencies before constructing this portion of the roadway to minimize impacts on the turtles. The road will be aligned to avoid affecting wood turtle habitat.

4.2.1.3 Socioeconomic Conditions

Realignment of personnel to Fort Belvoir from installations primarily located within the region, will result in a net increase of approximately 426 military and 3,430 civilian

personnel[2] at Fort Belvoir. Although some of the effects discussed below appear to be significant locally, the effects are not significant regionally (see Section 4.1.3).

4.2.1.3.1 Land Use. Both the preferred and alternative sites for all of the BRAC actions, as currently sited, are compatible with the future land use plan (Figure 4-8). The land use plan identifies land use zones at Fort Belvoir that are consistent with the existing land use and that consider Fort Belvoir's evolving mission from training to administration. As such, the training areas (T-7, T-9, and T-10) are limited primarily to the southwest peninsula outside of Accotink Bay Wildlife Refuge. These areas are currently being used for training activities that do not have adverse impacts on the refuge. Most of the undeveloped sites on both the North and South Posts have been designated for either administrative or community facilities to allow for future growth. In addition, several recreational areas are designated on both the North and South Posts. The research and development activities are restricted to the South Post near Tompkins Basin and the Defense Communications Electronics Evaluation and Testing Activity area on the North Post. The supply and storage areas are located adjacent to the research and development areas to improve efficiency and coordination. The proposed BRAC actions will not have a significant impact because they follow the current land use plan.

4.2.1.3.2 Population. It is estimated that 497 military and 3,679 civilian personnel will be realigned to Fort Belvoir from installations principally located within the Washington, D.C., metropolitan region. The effect of these actions is a net increase of approximately 426 military and 3,430 civilian personnel at Fort Belvoir.

Transfers out of the region include 88 military and 338 civilian personnel, who are expected to be realigned to Fort Devens in Massachusetts from Fort Belvoir and the leased ISC space within the Washington, D.C., metropolitan region. According to the information generated by the EIFS model, a total of 215 emp ces (67 military and 148 civilians) are expected to leave the region because of the realignment actions. These actions are expected to result in a 594-person decrease in regional population, which corresponds to a regional population decline of less than 0.02 percent. Table 4-3 shows the detailed income and population shifts expected because of BRAC actions.

4.2.1.3.3 Housing. The transfer of personnel out of the region from Fort Belvoir is expected to result in approximately a 120-unit decrease in the total number of occupied housing units within the region.

Transfer of personnel to Fort Belvoir, principally from within the region, is not expected to result in a change of residence for the affected personnel, but rather a change of commuting pattern.

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[2]All numbers for acreage, square footage, and personnel within the EIS are subject to fluctuations and are therefore approximate.

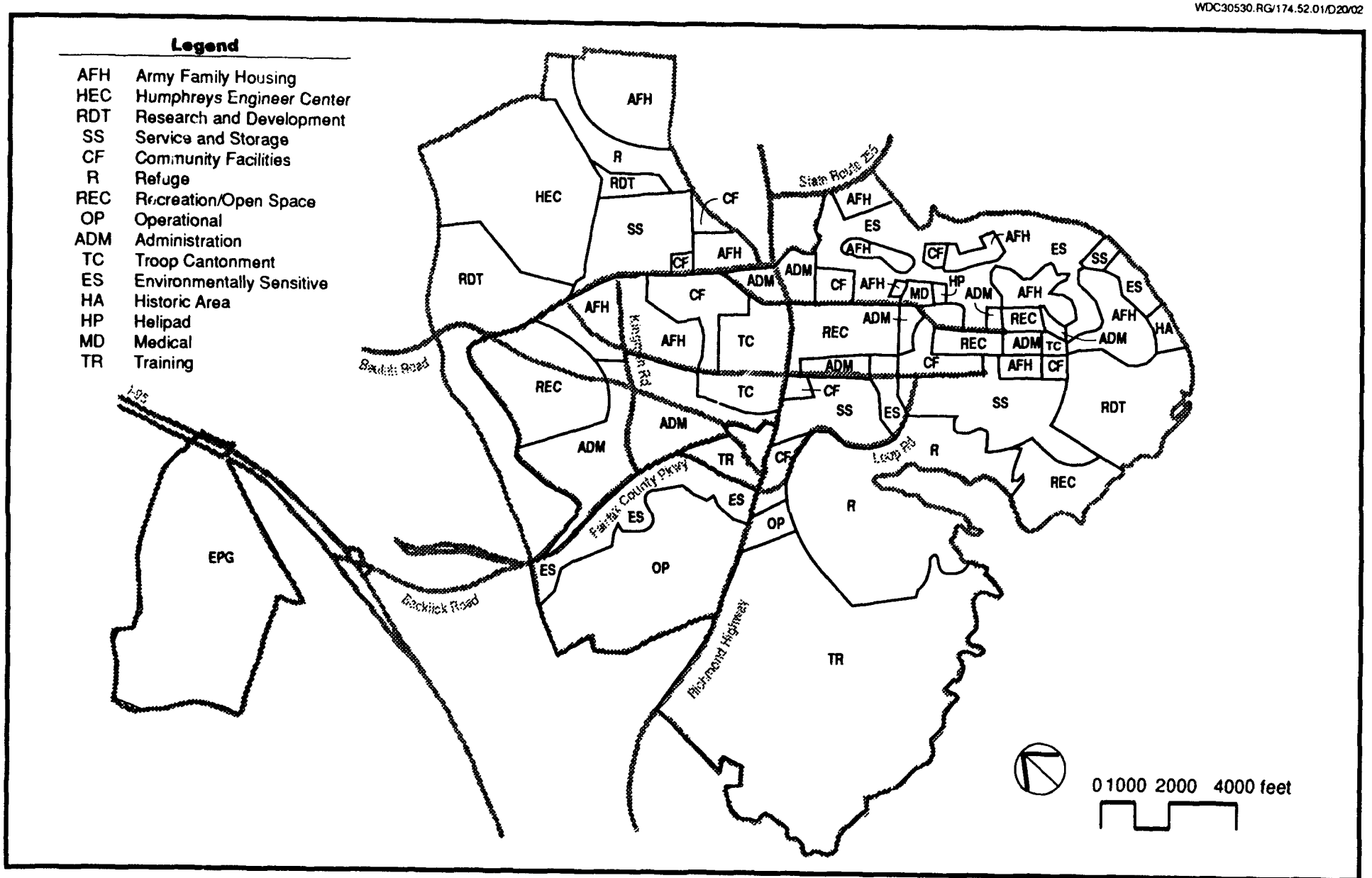


Figure 4-8
Fort Belvoir Future Land Use Plan

Table 4-3
MAJOR PERSONNEL CHANGES AT FORT BELVOIR, CAMERON STATION, AND FORT MYER AS A RESULT OF BRAC ACTIONS[a]

	Fort Belvoir (Additions)	Fort Belvoir (Deletions)	Cameron Station (Deletions)	Fort Myer (Additions)
Civilian Personnel				
Number	3,679	(249)	(3,518)	177
Wages & Salary[b]	$44,773	$44,773	$43,374	$25,198
Military Personnel				
Number	497	(71)	(317)	15
Wages & Salary	$31,162	$31,162	$31,033	$24,482
% On-Post	15%	15%	0%	
BRAC Construction	$173,040	$0	$15,400	$15,150
One-Time Expenditures	$24,311	$0	$9,811	$2,373
Total Other Jobs[c]				
Number	2,723	(199)	(2,596)	126
Wages & Salary	$13,595	$13,444	$13,647	$13,648

NOTES:
[a]This table does not include DOD activities in leased space, contractor personnel, or NAF personnel.
[b]Wages and salaries are annual averages.
[c]"Total Other Jobs" is applicable to civilian and military personnel and their resident family members.
SOURCE: *Socioeconomic Effects Report 1990. Socioeconomic Impacts of Fort Belvoir Related BRAC Actions*, EIFS Model data.

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Locally, the action may increase the demand for housing in the outer Virginia suburban jurisdictions. The increased demand would not be considered significant as most affected personnel are believed to reside within commuting distance of Fort Belvoir. The realignment of AMTL facilities from Watertown, Massachusetts, will involve the transfer of 5 military personnel and 195 civilian personnel and their families.

Realignment of personnel to Fort Belvoir may increase housing demand in the immediate area over time, as employees may choose to eventually relocate closer to their place of employment. Given the proximity of the sending facilities, the number of employees that would consider this option is not considered high. The Concept Development Plan outlines several whole-house renewal projects and the construction of new on-post housing, which should help to alleviate impacts on the local housing market.

4.2.1.3.4 Employment. The primary and secondary impacts of BRAC actions at Fort Belvoir are expected to result in an approximate 6,684-person-year increase in regional employment. People holding second jobs and working dependents will increase regional employment by 3,115 person-years.

4.2.1.3.5 Income. Addition of personnel to Fort Belvoir is expected to increase military wages and salaries by more than $31.1 million, and civilian wages and salaries by more than $44.7 million. Most of these salaries are being paid to people in the region, at Cameron Station. It is also estimated that student wages and salaries will increase by $.798 million, and trainee wages and salaries will increase by $.063 million. Second job income is also expected to increase by $34.3 million (SEA, 1990). The disposable portion of this income spent in the region is defined as sales volume. In the absence of a significant change in residence, the actions of realignment are not expected to have a significant impact on the regional income.

4.2.1.3.6 Construction and One-time Expenditures. Construction costs and one-time expenditures associated with P.L. 100-526 at Fort Belvoir are estimated to be nearly $200 million. Construction impacts will occur during the construction period of 1991 through 1994. The total primary and secondary impacts of realignment-associated construction will result in the regional sales volume increasing by $80.4 million, regional employment increasing by 1,397 person-years, and regional income increasing by $29.5 million. One-time expenditures will result in the regional sales volume increasing by $13.2 million, regional employment increasing by 143 person-years, and regional income increasing by $2.6 million.

4.2.1.3.7 Community and Army Facilities. The effects of alternative sites for the BRAC projects on community and army facilities are independent from basic siting considerations, except Alternative 2 for BRAC 2. As a result, a site-specific comparison of potential effects for each of the alternatives is not necessary. However, Alternative 2 for BRAC 2 is located in an area that would require significant upgrades to the existing utility infrastructure to support the facility. These upgrades could be prohibitive if adequate service connections could not be located nearby.

The net increase of military and civilian personnel at Fort Belvoir from the realignment of Cameron Station is not expected to have an immediate significant effect on local community facilities because few of these people are expected to move into the area. Some increased demand by employees on local retail services may occur. The increase in school enrollment is not expected to be significant. Because Fort Belvoir provides both fire and police protection on post, the demand on county services is not expected to be significant. Recreational and other facilities are also provided by the post, and can be used by both military and civilian employees.

The net increase of approximately 3,856 personnel at Fort Belvoir resulting from the realignment of BRAC activities to Fort Belvoir is expected to increase the waste volume from 42 tons per day to approximately 49 tons per day, a 16.6 percent increase in the current generation volume.

The activities realigned to Fort Belvoir as part of the BRAC will participate, to the extent practicable and allowable under their missions, in the postwide recycling program. Assuming a recycle rate of 25% of the waste stream, the overall waste generation rate for the post would be about 37 tons per day.

The previous solid waste landfilling at Fort Belvoir has the potential to affect one of the proposed sites. The preferred alternative for BRAC 2 is adjacent to an active debris landfill. As part of the site development plan, a design will be developed to prevent the migration of landfill gases to the surrounding areas. As a precautionary measure, a methane monitoring system will be installed within the buildings at this site.

Potable water usage is expected to increase by approximately 0.6 mgd because of the BRAC population increase. This increase is, however, well within the maximum usage agreement currently in effect between Fort Belvoir and the FCWA.

Wastewater generation is expected to increase by approximately 0.3 mgd because of the BRAC population increase. As with the water demand, the increase is well within the post's current agreement with the LPPCP. It should be noted that the LPPCP is currently planning to expand their treatment capacity to 54 mgd. This should also help offset the increased volumes generated at Fort Belvoir because of BRAC projects.

The realignment of personnel to Fort Belvoir will affect existing Army community facilities. However, this action should not have a significant long-term impact, as four of the BRAC actions (BRACs 4, 5, 6, and 9) should offset demand created on parallel services in the local community by the newly realigned personnel.

4.2.1.3.8 Traffic and Transportation

The preferred alternative and Alternative 2 for BRAC 1 are located adjacent to each other on the North Post. As a result, traffic heading towards either of these two sites would use the same access roads. However, the environmental constraints at Alternative 2 limit the number of access points to the site to two. These same constraints also dictate that primary site access will be from the Fairfax County Parkway. The

preferred alternative provides for two access point from BRAC 3 and two access points from Beulah Street (Figure 4-9).

The use of Alternative 3 for BRAC 1 would require that all of the activities, which would be centralized at either the preferred alternative or Alternative 2, be scattered throughout the post in buildings vacated by the Engineer School. Although this would disperse traffic somewhat, the majority of these vacated buildings are located on the South Post in areas that are already heavily congested. In addition, these buildings have already been assigned for occupancy by other smaller activities, including some that will also relocate to Fort Belvoir from Cameron Station.

The preferred alternative for BRAC 2 locates the Industrial Park near industrial activities. The construction of MCA 31, will allow truck traffic to and from BRAC 2 to avoid the main sections of the South Post by providing direct access to BRAC 2.

Poe Road would be the only access point to Alternative 2 for BRAC 2. This road is already heavily traveled by trucks going to and from the landfill, as well as troop vehicles during training exercises. The road would need to be upgraded from its current condition, unimproved dirt, to a minimum of two paved lanes to support the traffic generated by BRAC 2.

Locating BRAC 4 at the preferred alternative on the North Post minimizes additional truck traffic on the South Post in the vicinity of the South Post commissary (Alternative 2). The shopping area on the South Post generates large volumes of patron traffic in an area already congested by traffic accessing nearby housing and the BRDEC.

The preferred alternative for BRAC 5 creates a second shopping area on Fort Belvoir. Patrons shopping at the North Post commissary will most likely also shop at the North Post PX minimizing traffic flows during peak shopping periods. Because of the concentration of post housing on the South Post, most of the patrons using the South Post shopping area are expected to be Fort Belvoir residents after BRAC 5 is constructed at the preferred alternative. The patrons using the new shopping facility on the North Post are expected to come primarily from off post.

The construction of BRAC 6 at the preferred alternative should have an effect similar to that of BRAC 5. By creating a centralized shopping facility on South Post, traffic between the North Post and South Post during peak shopping periods should be reduced.

Neither the preferred alternative nor Alternative 2 for BRACs 7 and 8 is expected to significantly affect local traffic patterns because of their proximity to each other. Alternative 2 for both BRACs 7 and 10 required that additional facilities be constructed to house the activities being realigned into existing structures. This alternative has not been actively pursued because of the costs involved. As a result, neither BRAC 7 nor BRAC 10 is expected to have a significant impact on local traffic patterns.

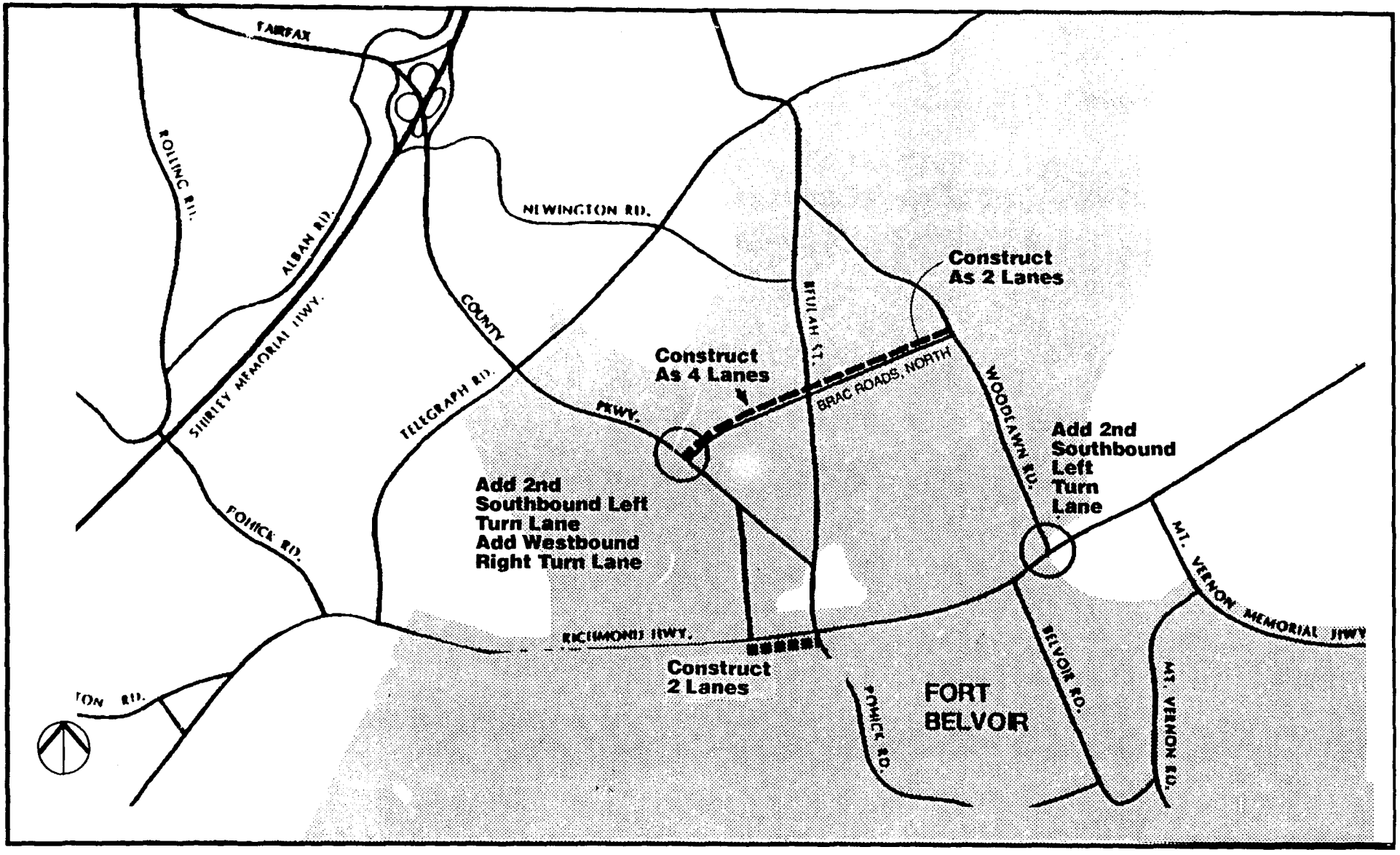


Figure 4-9
1995 Improvements to Mitigate BRAC Impacts

ENVIRONMENTAL IMPACT STATEMENT
Comprehensive Base Realignment/Closure
and Fort Belvoir Development
Arlington and Fairfax Counties and the City of Alexandria, VA

4.2.1.3.8.1 Baseline Assumption. With the addition of the Fort Belvoir BRAC projects, traffic volumes on study-area roadways may increase above baseline levels. Figure 4-9 shows the locations where improvement may be required because of the addition of the approximately 3,856 jobs resulting from BRAC projects. Baseline transportation systems were defined in order to provide a benchmark for determining the effects of the proposed development. The baseline systems contain improvements that are planned or programmed by public agencies to be in place, and any other improvements required to accommodate future-year baseline traffic conditions. Baseline traffic is the existing traffic plus normal growth without Fort Belvoir development. The baseline transportation systems encompass the principal travel modes in northern Virginia. These travel modes include the roadway network, the high-occupancy vehicle (HOV) lane network, and the existing and planned transit systems (rail and bus). Additional details of the base network and major improvement assumptions are described in the *Fort Belvoir Regional Traffic Impact Analysis: Assessment of Horizon Year Traffic Impacts* (June 1990) (hereafter referred to as the *Regional Traffic Impact Analysis*). Improvements to the public highways (Fairfax County Parkway and Richmond Highway) are the responsibility of VDOT. Funding of practicable improvements will be negotiated among VDOT, Fairfax County, and the Department of the Army.

4.2.1.3.8.2 Year 1995. Table 4-4 presents a summary of the effects of BRAC development on traffic at intersections in the Fort Belvoir area. The table shows the forecast 1995 LOS at the intersection before any BRAC development, but with the additional traffic generated by normal growth in the region and with a set of assumed transportation system improvements. As shown in the table, these baseline improvements are structured to bring the 1995 baseline conditions to LOS D or better at each of the locations analyzed. Assuming the same baseline transportation system, the addition of BRAC-generated traffic, as shown in the table, would significantly affect traffic operations at three of the intersections that were analyzed. Appropriate measures to mitigate traffic may need to be taken.

Table 4-5 shows volume-to-capacity ratios of the traffic demand under several different transportation system and development scenarios for the intersections in the Fort Belvoir area that were analyzed. The second column of the table lists the 1990 volume-to-capacity rtios for the morning and evening peak hours. Several of the intersections have current volume-to-capacity ratios between 0.90 and 1.00 (LOS E conditions, which are less than desirable) and several exceed 1.00 (LOS F conditions, which means excessive delays).

The third and fourth columns list the forecast volume-to-capacity ratios in the year 1995, assuming that the appropriate baseline improvements are implemented by Fairfax County and the VDOT in order to bring the baseline conditions at all analyzed intersections to LOS D or better. Under the "baseline" heading, the volume-to-capacity ratios indicate that the intersections are forecast to operate at LOS D or better. If BRAC-generated traffic is included, as shown under the "BRAC" heading, several of the intersections would degrade to LOS E conditions.

Table 4-4
IMPACT OF BRAC DEVELOPMENT ON INTERSECTION LEVEL OF SERVICE

Intersection	1995 Baseline		1995 With BRACs	
	AM	PM	AM	PM
Armistead Road/Richmond Highway	D	D	E	E
Backlick Road/BRAC Roads, North	-	-	B	C
Backlick Road/Richmond Highway	A	B	A	B
Belvoir Road/Richmond Highway	C	A	C	A
Beulah Street/Telegraph Road	C	D	D	D
Mount Vernon Memorial Highway/ Richmond Highway	C	C	D	D
Newington Road/Telegraph Road	B	C	B	C
Pohick Road/Richmond Highway	D	D	E	E
Richmond Highway/Woodlawn Road	B	D	B	D
Richmond Highway/Telegraph Road	D	D	E	E

Note: Baseline roadway network assumes improvements by public agencies to provide LOS D at all locations. Levels of service shown for "1995 With BRACs" condition do not include recommended improvements to mitigate impacts.

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Table 4-5
VOLUME-TO-CAPACITY RATIOS:
FORT BELVOIR STUDY AREA

Intersection	1990	1995 With Baseline Improvements		1995 Without Baseline Improvements	
		Baseline	BRAC	Baseline	BRAC
AM PEAK HOUR					
Armistead Road/ Richmond Highway	0.98	0.84	0.92	1.25	1.39
Backlick Road/ Telegraph Road	0.88	NA	NA	1.26	1.51
Backlick Road/ BRAC Roads, North	NA	NA	0.63	NA	0.80
Backlick Road/ Richmond Highway	0.65	0.58	0.60	1.46	1.74
Belvoir Road/ Richmond Highway	0.63	0.73	0.74	0.93	0.94
Beulah Street/ Telegraph Road	0.97	0.79	0.87	1.11	1.20
Mount Vernon Memorial Highway/ Richmond Highway	0.69	0.77	0.86	1.01	1.14
Newington Road/ Telegraph Road	0.69	0.66	0.67	0.75	0.79
Pohick Road/ Richmond Highway	1.08	0.83	0.94	1.22	1.37
Richmond Highway/ Woodlawn Road	0.56	0.68	0.71	0.93	0.96
Richmond Highway/ Telegraph Road	0.97	0.89	0.95	1.18	1.32

Table 4-5
VOLUME-TO-CAPACITY RATIOS:
FORT BELVOIR STUDY AREA

Intersection	1990	1995 With Baseline Improvements		1995 Without Baseline Improvements	
		Baseline	BRAC	Baseline	BRAC
PM PEAK HOUR					
Armistead Road/ Richmond Highway	0.88	0.91	0.96	1.27	1.35
Backlick Road/ Telegraph Road	0.98	NA	NA	1.57	1.69
Backlick Road/ BRAC Roads, North	NA	NA	0.79	NA	1.09
Backlick Road/ Richmond Highway	1.06	0.67	0.70	1.62	1.89
Belvoir Road/ Richmond Highway	0.48	0.55	0.56	0.73	0.74
Beulah Street/ Telegraph Road	1.05	0.84	0.84	1.29	1.32
Mount Vernon Memorial Highway/ Richmond Highway	0.76	0.79	0.82	0.99	1.12
Newington Road/ Telegraph Road	0.84	0.75	0.76	0.83	0.85
Pohick Road/ Richmond Highway	1.11	0.90	0.98	1.41	1.53
Richmond Highway/ Woodlawn Road	0.77	0.86	0.89	1.13	1.17
Richmond Highway/ Telegraph Road	1.09	0.88	0.99	1.35	1.50

The last two columns in Table 4-5 show the estimated effect if the baseline improvements are not implemented (i.e., if the existing transportation system is not improved by the year 1995). Under the "baseline" heading, the majority of the analyzed intersections would degrade to LOS F. For the intersections with estimated volume-to-capacity ratios that exceed 1.10, the actual conditions will reflect demand that substantially exceeds available capacity. Therefore, some of this vehicular demand would be diverted to other corridors, which in this sector of the region are almost at or above capacity, or the demand have to be spread over a longer peak period. The impact of the BRAC-generated traffic being loaded into a system with no improvements is shown in the last column of the table.

The forecast 1995 composition of the traffic flow in the Fort Belvoir area is shown in Figure 4-10. The traffic flows at a cordon drawn around Fort Belvoir are divided by facility into either BRAC-generated traffic or baseline (or background) traffic. This figure presents an accurate portrayal of the relative magnitude of the impact of BRAC-generated traffic on overall traffic flows by facility.

The traffic volumes generated by the development that is proposed as part of Fort Belvoir BRAC Plan may require the following additional roadway improvements:

- Widen Richmond Highway (U.S. Route 1) by an additional two lanes between Lorton/Armistead Roads and the Fairfax County Parkway (i.e., from the baseline requirement of 6 lanes to 8 lanes)

- Develop BRAC Roads as post roads open to the public from Fairfax County Parkway to Gunston Road as a 4-lane facility and from Gunston Road to Woodlawn Road as a 2-lane facility

- Improve the intersection of the Fairfax County Parkway and BRAC Roads

Widening Richmond Highway by an additional two lanes (i.e., from the required six lanes from 1995 baseline conditions to eight lanes) between Lorton/Armistead Roads and the Fairfax County Parkway would be one of the single most expensive improvements necessary. Right-of-way costs would be minimized, however, because approximately one-half of the necessary additional right-of-way is Fort Belvoir property. The environmental impacts of this project could also be minimized by widening Richmond Highway primarily on the north side in order to avoid the more extensive wetlands that are located to the south of the current alignment. Because Richmond Highway would need to be flared as part of the baseline improvements at Telegraph Road in order to accommodate a second left turn lane from eastbound Richmond Highway onto northbound Telegraph Road, the plan to widen Richmond Highway on the north side would also reduce potential impacts on Pohick Church.

An alternative to the 8-lane cross section for Richmond Highway would be to upgrade Richmond Highway to a controlled-access, 6-lane expressway with grade-separated interchanges at Telegraph Road and at the Fairfax County Parkway. It should be

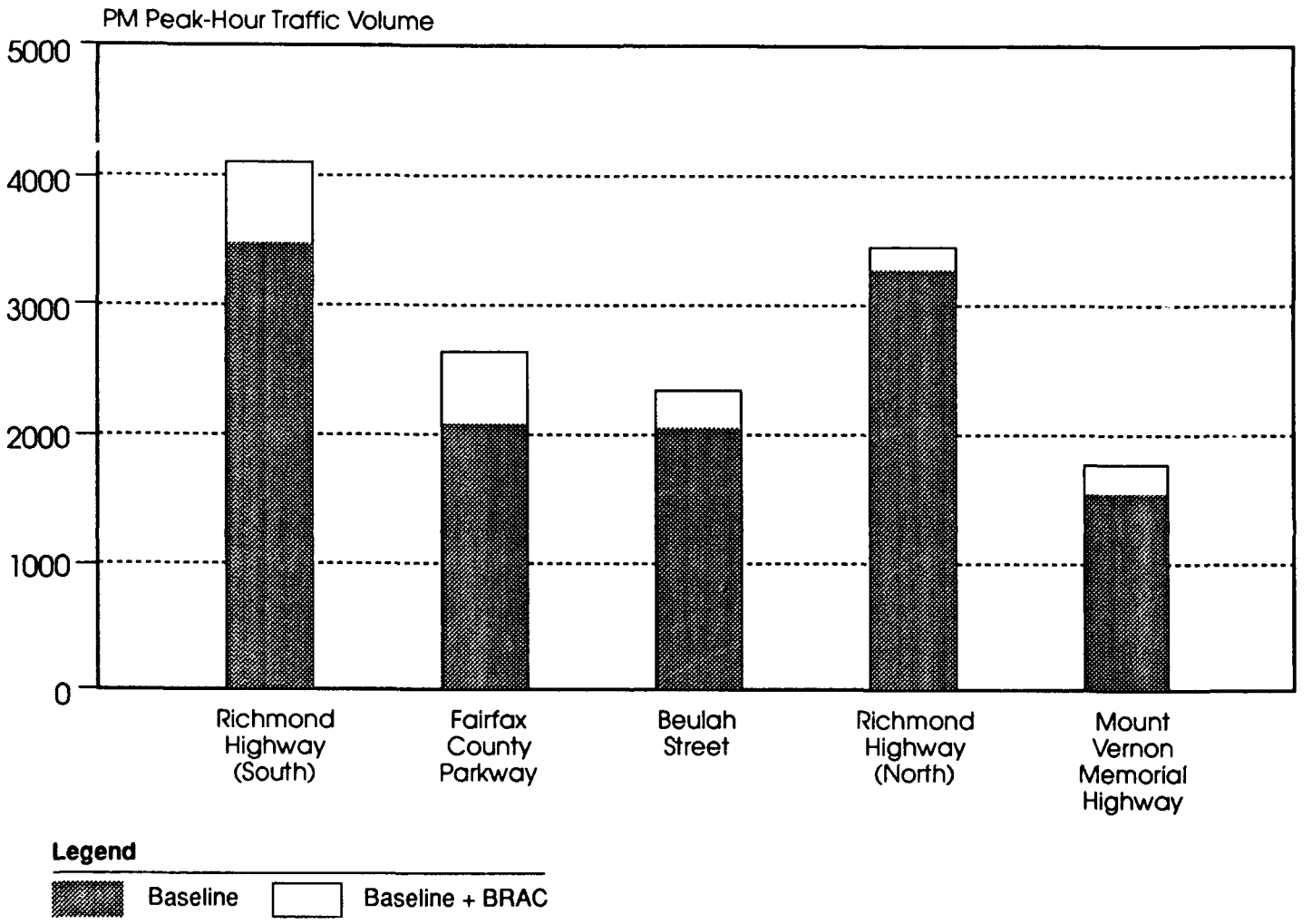


Figure 4-10
Impact of BRAC Traffic

noted that these interchanges are called for in the *The Comprehensive Plan for Fairfax County, Virginia* (July 24, 1989), hereafter called the *Fairfax County Comprehensive Plan*. The 6-lane expressway (or the 8-lane arterial) is also required for year 2000 baseline conditions.

An alternative to the additional widening of Richmond Highway between Lorton/ Armistead and Backlick Roads is to widen Richmond Highway between Armistead and Telegraph Roads and to widen Telegraph Road to four lanes from Richmond Highway to Franconia Road. Widening Telegraph Road to six lanes (as called for in the *Fairfax County Comprehensive Plan*) does not further reduce the number of lanes required for Richmond Highway.

Another alternative for the corridor is to widen I-95 to 10 lanes (4-2-4) as called for in the *Fairfax County Comprehensive Plan*. Richmond Highway could then remain as a 6-lane facility as dictated by 1995 baseline conditions.

BRAC Roads, North, should be constructed as 4-lane facilities between Fairfax County Parkway and Gunston Road in order to accommodate traffic volumes and vehicle turning movements, and should be extended from Gunston Road to Woodlawn Road as a 2-lane facility. East of Woodlawn Road the roadway cross section should be further evaluated in terms of circulation on base and pedestrian safety as part of the transportation planning that will be included in the future Master Plan. Between the Fairfax County Parkway and Gunston Road, the road should have four lanes with a center median to accommodate separate turn lanes as necessary. Turn lanes will probably be needed at the entrances to BRAC 1, at Beulah Street, and at Gunston Road. Between Gunston Road and Woodlawn Road, a 2-lane cross section with curb, gutter, and sidewalks should be provided.

The other necessary improvement in the Fort Belvoir area is the addition of a second turn lane from southbound Fairfax County Parkway to BRAC Roads, North, and the provision of a free right turn lane from BRAC Roads, North, at that location. These lanes should be included in the initial intersection construction. They are identified here as amendments to VDOT's preliminary design plans for the intersection.

In addition to the intersections cited above, it is expected that improvements may be needed at the currently unsignalized intersections of Beulah Street with Woodlawn Road and Backlick Road. The former intersection is planned to be reconstructed as part of the Beulah Road widening project. However, final design of the roadway cross section and of the intersection has not yet been completed; therefore, the impact of site-generated traffic cannot be accurately assessed. In fact, it is quite possible that the final design to accommodate baseline needs may also accommodate the Fort Belvoir BRAC projects and the Concept Development Plan. The latter intersection will be particularly affected by the siting of BRAC 1 along BRAC Roads, North, and Beulah Street. Upon completion of the preliminary site plan, a detailed assessment of traffic operations through this intersection should be conducted.

The Army will coordinate its traffic improvement plans with state and local highway departments to determine the best methods to mitigate the regional transportation impacts generated both by the Army and by local growth. These improvements will include the addition of left- and right-turn lanes, traffic signals or significant upgrades, and additional lanes, or participation in new highway projects. These projects will support traffic generated by Army development between Backlick Road and Beulah Street, south of Telegraph Road.

4.2.1.4 Cultural Resources

4.2.1.4.1 Historic and Archeological Resources. Development activities at Fort Belvoir may affect some of the many identified prehistoric and historic archeological sites, either directly through earth movement or, in most cases, indirectly through increased use of areas in the vicinity of resource sites. Building locations for the realigned activities are now in the planning phase, and may change somewhat, because of design criteria, environmental constraints, or other factors during the detailed design phase. Because exact building "footprints" for most of these projects are not yet available, direct impacts to historic and archeological sites can only be analyzed in general.

Table 4-6 lists the proposed BRAC facility alternatives and identifies additional surveys that will be required before construction begins on each site. None of the BRAC projects will affect a known cultural resource site. However, Phase I cultural resource surveys have not been completed for the preferred sites for BRACs 1, 2, 3, 8, and 9. In addition, Phase I cultural resource surveys have not been completed for Alternative 3 for BRAC 1, and Alternative 2 for BRACs 2, 3, 6, and 8. These surveys will be completed before final siting and design, and follow-up action (Phase II, evaluation, and Phase III, recovery, surveys) will be taken if required. The Army has initiated coordination with the SHPO for all of the surveys.

The preferred alternative for BRAC 9, the Exchange Branch, is located near the Woodlawn Friends Meeting House and Cemetery site. However, this resource site is fenced and is across the road from the project site, therefore no impact is expected. Similarly, the North Post Commissary Warehouse is in the vicinity of, but is not expected to affect, two historic cemeteries, Lacey Hill and Woodlawn Methodist. None of the BRAC actions are within Fort Belvoir's Historic District. However, one structure that will be affected by BRAC 7, Building 1465, is old enough to require a standing-structure survey to determine if it is eligible for placement on the National Register of Historic Places.

4.2.1.4.2 Visual Resources. The BRAC projects are sited in developed areas of Fort Belvoir. No significant effects to visual resources are expected at any of the alternatives for any of the BRAC projects. The *Installation Design Guide, Fort Belvoir, Virginia* will be followed as site designs are developed.

Table 4-6
STATUS OF CULTURAL RESOURCE SURVEYS OF PROPOSED BRAC ACTIONS AT FORT BELVOIR

	Proposed Action	Status of Cultural Resource Surveys
BRAC 1 Preferred Alternative	Headquarters Complex	Most of site is surveyed or severely disturbed; small area around Buildings 2455-2457 needs a Phase I survey (currently listed as moderately disturbed)
BRAC 1 Alternative 2	Headquarters Complex	Surveys completed
BRAC 1 Alternative 3	Headquarters Complex	Standing-structures survey required before renovation of some buildings
BRAC 2 Preferred Alternative	Industrial Facilities	Most of site is surveyed or severely disturbed; small area around Buildings T-753 and T-754 needs a Phase I survey (listed as moderately disturbed)
BRAC 2 Alternative 2	Industrial Facilities	Portions moderately or severely disturbed, portions still need Phase I and standing-structure survey
BRAC 3, North Preferred Alternative	BRAC Roads	Phase I survey needed for entire project
BRAC 3, North Alternative 2	BRAC Roads	Phase I survey needed for entire project
BRAC 3, South Preferred Alternative	BRAC Roads	Most of site is moderately to heavily disturbed; southern portion needs a Phase I survey
BRAC 4 Alternative 1	Commissary Warehouse Addition	Severely disturbed, no survey needed
BRAC 4 Alternative 2	Commissary Warehouse Addition	Severely disturbed, no survey needed
BRAC 5 Preferred Alternative	Post Exchange	Severely disturbed, no survey needed
BRAC 5 Alternative 2	Post Exchange	Severely disturbed, no survey needed
BRAC 6 Preferred Alternative	Commissary	Severely disturbed, no survey needed
BRAC 6 Alternative 2	Commissary	Most of site moderately disturbed Phase I needed for easternmost portion
BRAC 7 Preferred Alternative	Administration Facility	Standing-structure survey needed (Building 1465)
BRAC 8 Preferred Alternative	Material Research Facility	Most of project site is severely disturbed; one portion needs a Phase I survey
BRAC 8 Alternative 2	Material Research Facility	Some portions moderately or severely disturbed; most of site needs Phase I and standing-structure surveys
BRAC 9 Preferred Alternative	Exchange Branch	Entire site needs a Phase I survey; classified as moderately disturbed
BRAC 9 Alternative 2	Exchange Branch	Site severely disturbed; no survey needed
BRAC 10 Preferred Alternative	Modify Buildings 1466 & 1445 for Base Closure	No archeological or historical impacts

4.2.1.5 Hazardous Materials

Most of the closure-related activities going to Fort Belvoir are administrative functions that do not use or generate hazardous materials. Those activities that use or generate hazardous materials as part of their mission will continue to do so regardless of final siting decisions. None of the alternative sites proposed for any of the BRAC projects would be eliminated because of this criteria alone. The AAFES gas station (BRAC 9) will have USTs and will require compliance with the Fort Belvoir, state, and local guidelines for installing new USTs. The new tanks will also have to comply with Fort Belvoir's spill prevention, control, and countermeasure (SPCC) plan.

The Institute of Heraldry discharges about 5 to 8 liters of photodeveloping solutions a week into the local sanitary sewer system at Cameron Station. This practice will be discontinued at the new facilities at Fort Belvoir because a silver-recovery system will be incorporated into the design. The DLA and the *Soldiers Magazine* publication office also operate photographic laboratories. After silver recovery they have historically discharged about 37 to 74 liters/month of photodeveloping solution into the sanitary system. Their plans include the same operating procedures when they relocate to Fort Belvoir. Their solid wastes have typically been placed in containers and deposited into dumpsters with other refuse.

The AMTL activity that will be relocating from Massachusetts conducts research on material development and failure. The staff works with various metal alloys. A number of acids, solvents, bases, inorganic inhibitors, thermal spray powders, coating compounds (e.g., epoxy resins), and general chemicals (e.g, sodium chloride, potassium chloride, and magnesium fluoride) are used in relatively minor amounts in their research. This laboratory research is conducted in facilities with hoods to vent emissions and to maintain a safe work place. The DEH will determine whether an air emissions permit will be required from the Virginia State Air Pollution Control Board on the basis of the actual functions that will be transferring to Fort Belvoir. Any waste will be handled under the direction of DEH, which is responsible for the hazardous materials program at the installation. A PA was conducted of AMTL activities in Watertown, Massachusetts, by USATHAMA and it was found that these activities were in compliance with hazardous waste regulations. Air emissions impacts are discussed in Section 4.2.1.1.5. Used acetone and dichloroethane are collected for disposal outside the laboratory, however, small quantities may enter lab sinks during rinsing. Approximately 20 gallons of acetone and 55 gallons of dichloroethane are currently collected each year.

Section 4.2.1.1.2 also discusses the potential for adverse effects to groundwater quality at Fort Belvoir. None of the proposed BRAC projects will use groundwater as drinking- or process-water, therefore, no effects on the quantity of groundwater at Fort Belvoir are expected.

To protect the quality of groundwater at Fort Belvoir, those projects that require the transfer of fuels or hazardous chemicals will be required to comply with Fort Belvoir's SPCC plan and applicable federal, state, and local regulations. The plan is in place to

reduce the potential for significant impacts in case of accidental releases and to increase the efficiency of responses and cleanup to any releases.

4.2.1.6 Conclusions

Table 4-7 summarizes the impacts for the various alternatives for each of the BRAC projects. The accompanying text provides a more detailed discussion of the potentially significant site-specific impacts for each of the BRAC projects.

4.2.1.6.1 BRAC 1. The preferred alternative for BRAC 1 will have minimal effects on biophysical, socioeconomic, and cultural resources. Figure 4-11 shows a preliminary site layout for this alternative. A 250- to 300-foot vegetated buffer will be maintained to the north of the site to maintain the genetic corridor. As previously discussed all federal, state, and county environmental regulations will be followed during construction.

Although all applicable regulations would be followed during the development of Alternative 2 for BRAC 1, the need for bridges to minimize impacts to wetlands, the need for extensive RPA buffers, and the restricted access afforded by the site all limit the buildable area on the site. Meeting these parameters would cause more significant traffic problems than the preferred alternative.

Alternative 3 for BRAC 1 does not meet the needs of the activities being relocated to Fort Belvoir because the activities would be scattered at various locations on the South Post. This would make coordination among activities difficult because they would be physically separated. In addition, many of the buildings proposed for use as part of this alternative will be required by other agencies relocating to Fort Belvoir under P.L. 100-526, and the remainder are already assigned to other activities.

4.2.1.6.2 BRAC 2. The preferred alternative for BRAC 2 is located near the other service and storage facilities at Fort Belvoir. Figure 4-12 shows a preliminary site layout for this alternative. The proposed MCA 31 will provide direct access to the site for the anticipated truck traffic. In addition, the existing utility infrastructure is adequate at this location.

BRAC 2, Alternative 2, is located near the Poe Road Landfill. The existing utility infrastructure would need to be upgraded and a new road constructed for this site to be considered a feasible alternative. The costs associated with the utility upgrades may be prohibitive.

4.2.1.6.3 BRAC 3. The preferred alternative for BRAC 3, North, would be the construction of a two-lane road between Woodlawn Road and Gunston Road and a four-lane road between Gunston Road and the Fairfax County Parkway. This alternative would provide multiple access points to the preferred alternative for BRAC 1. Although this alternative would require three more stream crossings than Alternative 2, once the engineering plans are completed, all required permits will be obtained and mitigation completed as required.

Table 4-7
Comparison of Effects of Proposed BRAC Alternatives at Fort Belvoir

	BRAC 1 Headquarters Complex Preferred Alternative	**BRAC 1 Headquarters Complex Alternative 2**
Physiography and Topography	Final site design will minimize cut and fill.	Buildable area restricted to elevations above 125-feet MSL because of RPA requirements.
Geology and Groundwater	No impact.	No impact.
Soils	No building constraints.	Soil survey incomplete, subsurface investigation required.
Surface Water	Bordered by a perennial stream, RPAs infringe slightly into site.	Runoff from the bridges and culverts required may increase amounts of pollutants in streams.
Climate and Air Quality	No impact.	No impact.
Wildlife Genetic Corridor	Will constrict corridor, site design will include a 250- to 300-foot vegetated buffer to maintain corridor.	Will constrict corridor, site design will include a 250- to 300-foot vegetated buffer to maintain corridor.
Vegetation	No impact.	No impact.
Wildlife	Road kills could increase; vegetated buffer (see above) can minimize.	Road kills could increase; vegetated buffer (see above) can minimize.
Game Species	Same as above.	Same as above.
Wetlands	Preliminary screening indicates no wetlands on site; jurisdictional delineation will be completed before construction; no effects on RPA buffers.	Preliminary screening indicates no wetlands on site; jurisdictional delineation will be completed before construction; no effects on RPA buffers.
Aquatic Biota	No impact.	Runoff from the required bridges and culverts may negatively affect aquatic biota.
Threatened and Endangered Species	No impact.	No impact.
Land Use	Compatible with existing land use.	Compatible with existing land use.
Population	Will increase population at Fort Belvoir by approximately 3,280 employees.	Will increase population at Fort Belvoir by approximately 3,280 employees.
Housing	No impact.	No impact.
Employment	No impact.	No impact.
Income	No impact.	No impact.
Community and Army Facilities	Will increase demand on some facilities; will generate an additional 6 tons per day of solid waste, will participate in recycling program.	Will increase demand on some facilities; will generate an additional 6 tons per day of solid waste, will participate in recycling program.
Traffic and Transportation	Road network will be needed, BRAC 3, preferred alternative and MCA 16 will mitigate.	Road network will be needed, BRAC 3, preferred alternative and MCA 16 will mitigate.
Cultural Resources	Phase I survey needed on part of site.	No impacts, surveys completed.
Hazardous Materials	Minimal amounts of hazardous materials will be generated and disposed of according to regulations.	Minimal amounts of hazardous materials will be generated and disposed of according to regulations.

Table 4-7
Comparison of Effects of Proposed BRAC Alternatives at Fort Belvoir

	BRAC 1 Headquarters Complex Alternative 3	
Physiography and Topography		
Geology and Groundwater	No impact.	
Soils	No impact.	
Surface Water	No impact.	
Climate and Air Quality	No impact.	
Wildlife Genetic Corridor	No impact; outside corridor.	
Vegetation	No impact.	
Wildlife	No impact.	
Game Species	No impact.	
Wetlands	No impact.	
Aquatic Biota	No impact.	
Threatened and Endangered Species	No impact.	
Land Use	Compatible with existing land use.	
Population	Will increase population at Fort Belvoir by approximately 3,280 employees.	
Housing	No impact.	
Employment	No impact.	
Income	No impact.	
Community and Army Facilities	Will increase demand on some facilities; will generate an additional 6 tons per day of solid waste, will participate in recycling program.	
Traffic and Transportation	Will increase congestion on Richmond Highway and the South Post.	
Cultural Resources	Standing structure survey required.	
Hazardous Materials	Minimal amounts of hazardous materials will be generated and disposed of according to regulations.	

Table 4-7
Comparison of Effects of Proposed BRAC Alternatives at Fort Belvoir

	BRAC 2 Industrial Park Preferred Alternative	BRAC 2 Industrial Park Alternative 2
Physiography and Topography	Site is located adjacent to closed debris landfill.	No impact.
Geology and Groundwater	No impact.	No impact.
Soils	100% high water table; may present engineering constraints.	50% high water table; 10% steep slope.
Surface Water	No impact.	Runoff from the required culverts may increase amounts of pollutants in streams.
Climate and Air Quality	No impact.	No impact.
Wildlife Genetic Corridor	No impact; outside corridor.	No impact; outside corridor.
Vegetation	No impact.	No impact.
Wildlife	No impact.	No impact.
Game Species	No impact.	No impact.
Wetlands	No impact.	Preliminary screening indicates no wetlands on site; jurisdictional delineation will be completed before construction; no effects on RPA buffers.
Aquatic Biota	No impact.	Runoff from the required bridges and culverts may negatively affect aquatic biota.
Threatened and Endangered Species	No impact.	No impact.
Land Use	Compatible with existing land use.	Compatible with existing land use.
Population	Will increase population at Fort Belvoir by approximately 173 employees.	Will increase population at Fort Belvoir by approximately 173 employees.
Housing	No impact.	No impact.
Employment	No impact.	No impact.
Income	No impact.	No impact.
Community and Army Facilities	Will increase demand on some facilities; will generate an additional 0.32 tons per day of solid waste, will participate in recycling program.	Will increase demand on some facilities; will generate an additional 0.32 tons per day of solid waste, will participate in recycling program; will require significant utility infrastructure upgrades.
Traffic and Transportation	Road network will be needed. MCA 31 will mitigate.	New access roads will be required to handle truck traffic.
Cultural Resources	Phase I survey needed on part of site.	Phase I and standing-structure surveys required.
Hazardous Materials	Minimal amounts of hazardous materials will be generated and disposed of according to regulations.	Minimal amounts of hazardous materials will be generated and disposed of according to regulations.

Table 4-7
Comparison of Effects of Proposed BRAC Alternatives at Fort Belvoir

	BRAC 3, NORTH BRAC Roads Preferred Alternative	BRAC 3, NORTH BRAC Roads Alternative 2
Physiography and Topography	Final site design will minimize cut & fill.	No impact.
Geology and Groundwater	No impact.	No impact.
Soils	7% hydric soil, 19% high water table; 11% steep slopes; engineering constraints.	50% high water table; 10% steep slopes.
Surface Water	Will need culverts to minimize effects of the 6 stream crossings needed.	Will need culverts to minimize the effects of the 3 stream crossings needed.
Climate and Air Quality	No impact.	No impact.
Wildlife Genetic Corridor	Road will be designed with bridges and box culverts to permit safe movement of wildlife within corridor.	Road will be designed with bridges and box culverts to permit safe movement of wildlife within corridor.
Vegetation	Clearing will be required in the right-of-way.	Clearing will be required in the right-of-way.
Wildlife	Road kills could increase; box culverts (see above) could minimize numbers of road kills.	Road kills could increase; box culverts (see above) could minimize numbers of road kills.
Game Species	Same as above.	Same as above.
Wetlands	A Section 404 Permit will be required; RPA buffers will be affected.	A Section 404 Permit will be required; RPA buffers will be affected.
Aquatic Biota	Temporary construction impacts; BMPs will be used to minimize downstream sedimentation.	Temporary construction impacts; BMPs will be used to minimize downstream sedimentation.
Threatened and Endangered Species	Complete survey required for final right-of-way; wood turtles located near intersection with Woodlawn Road.	No impact.
Land Use	No impact.	No impact.
Population	No impact.	No impact.
Housing	No impact.	No impact.
Employment	No impact.	No impact.
Income	No impact.	No impact.
Community and Army Facilities	Will mitigate effects of BRAC.	Will mitigate effects of BRAC, however, not as effectively as the preferred alternative.
Traffic and Transportation	Should improve traffic locally.	Will not mitigate traffic increases as well as the preferred alternative because this alternative eliminates Woodlawn Road as an access point.
Cultural Resources	Phase I survey needed for right-of-way.	Phase I survey needed for right-of-way.
Hazardous Materials	No impact.	No impact.

Table 4-7
Comparison of Effects of Proposed BRAC Alternatives at Fort Belvoir

	BRAC 3, SOUTH **BRAC Roads** **Preferred Alternative**	
Physiography and Topography	No impact.	
Geology and Groundwater	No impact.	
Soils	5% high water table.	
Surface Water	Will need culverts to minimize effects of the 2 stream crossings required.	
Climate and Air Quality	No impact.	
Wildlife Genetic Corridor	No impact.	
Vegetation	Minimal clearing required.	
Wildlife	No impact.	
Game Species	No impact.	
Wetlands	Will require a Section 404 Nationwide 14 permit and a Section 401 water quality certificate for 2 stream crossings.	
Aquatic Biota	Temporary construction impacts; BMPs will be used to minimize downstream sedimentation.	
Threatened and Endangered Species	No impact.	
Land Use	No impact.	
Population	No impact.	
Housing	No impact.	
Employment	No impact.	
Income	No impact.	
Community and Army Facilities	Will mitigate effects of BRAC 2.	
Traffic and Transportation	Should improve traffic locally.	
Cultural Resources	Phase I survey needed for a portion of the right-of-way.	
Hazardous Materials	No impact.	

Table 4-7
Comparison of Effects of Proposed BRAC Alternatives at Fort Belvoir

	BRAC 4 Commissary Warehouse Addition Alternative 1	**BRAC 4 Commissary Warehouse Addition Alternative 2**
Physiography and Topography	Final site design will minimize cut & fill.	No impact.
Geology and Groundwater	No impact.	No impact.
Soils	25% high water table; may present engineering constraints.	No impact.
Surface Water	No impact.	No impact.
Climate and Air Quality	No impact.	No impact.
Wildlife Genetic Corridor	No impact; outside corridor.	No impact; outside corridor.
Vegetation	No impact.	No impact.
Wildlife	No impact.	No impact.
Game Species	No impact.	No impact.
Wetlands	No impact.	No impact.
Aquatic Biota	No impact.	No impact.
Threatened and Endangered Species	No impact.	No impact.
Land Use	Compatible with existing land use.	Compatible with existing land use.
Population	Will increase population at Fort Belvoir by approximately 51 employees.	Will increase population at Fort Belvoir by approximately 51 employees.
Housing	No impact.	No impact.
Employment	No impact.	No impact.
Income	No impact.	No impact.
Community and Army Facilities	Will mitigate effects of BRAC (Cameron Station commissary closure); will increase solid waste generation, will participate in recycling program, specifically cardboard recycling.	Will mitigate effects of BRAC (Cameron Station commissary closure); will increase solid waste generation, will participate in recycling program, specifically cardboard recycling.
Traffic and Transportation	Will increase local traffic.	Will increase local traffic.
Cultural Resources	Severely disturbed, no survey needed.	Severely disturbed, no surveys needed.
Hazardous Materials	No impact.	No impact.

Table 4-7
Comparison of Effects of Proposed BRAC Alternatives at Fort Belvoir

	BRAC 5 Post Exchange Preferred Alternative	**BRAC 5 Post Exchange Alternative 2**
Physiography and Topography	No impact.	No impact.
Geology and Groundwater	No impact.	No impact.
Soils	100% high water table; possible building constraints.	No impact.
Surface Water	No impact.	No impact.
Climate and Air Quality	No impact.	No impact.
Wildlife Genetic Corridor	No impact; outside corridor.	No impact; outside corridor.
Vegetation	No impact.	No impact.
Wildlife	No impact.	No impact.
Game Species	No impact.	No impact.
Wetlands	No impact.	No impact.
Aquatic Biota	No impact.	No impact.
Threatened and Endangered Species	No impact.	No impact.
Land Use	Compatible with existing land use.	Compatible with existing land use.
Population	No impact.	No impact.
Housing	No impact.	No impact.
Employment	No impact.	No impact.
Income	No impact.	No impact.
Community and Army Facilities	Will mitigate effects of BRAC (Cameron Station PX closure); will increase solid waste generation, will participate in recycling program, specifically cardboard recycling.	Will mitigate effects of BRAC (Cameron Station PX closure); will increase solid waste generation, will participate in recycling program, specifically cardboard recycling.
Traffic and Transportation	Will increase local traffic.	Will increase local traffic.
Cultural Resources	Severely disturbed, no surveys needed.	Severely disturbed, no surveys needed.
Hazardous Materials	No impact.	No impact.

Table 4-7
Comparison of Effects of Proposed BRAC Alternatives at Fort Belvoir

	BRAC 6 Commissary Preferred Alternative	**BRAC 6 Commissary Alternative 2**
Physiography and Topography	Final site design will minimize cut & fill.	No impact.
Geology and Groundwater	No impact.	No impact.
Soils	100% high water table; possible building constraint.	No impact.
Surface Water	No impact.	No impact.
Climate and Air Quality	No impact.	No impact.
Wildlife Genetic Corridor	No impact; outside corridor.	No impact; outside corridor.
Vegetation	No impact.	No impact.
Wildlife	No impact.	No impact.
Game Species	No impact.	No impact.
Wetlands	No impact.	No impact.
Aquatic Biota	No impact.	No impact.
Threatened and Endangered Species	No impact.	No impact.
Land Use	Compatible with existing land use.	Compatible with existing land use.
Population	No impact.	No impact.
Housing	No impact.	No impact.
Employment	No impact.	No impact.
Income	No impact.	No impact.
Community and Army Facilities	Will mitigate effects of BRAC (Cameron Station commissary closure); will increase solid waste generation, will participate in recycling program, specifically cardboard recycling.	Will mitigate effects of BRAC (Cameron Station commissary closure); will increase solid waste generation, will participate in recycling program, specifically cardboard recycling.
Traffic and Transportation	Will increase local traffic.	Will increase local traffic.
Cultural Resources	Severely disturbed, no surveys needed.	Phase I survey needed on part of site.
Hazardous Materials	No impact.	No impact.

Table 4-7
Comparison of Effects of Proposed BRAC Alternatives at Fort Belvoir

	BRAC 7 Administration Facility Preferred Alternative	
Physiography and Topography	No impact.	
Geology and Groundwater	No impact.	
Soils	No impact.	
Surface Water	No impact.	
Climate and Air Quality	No impact; outside corridor.	
Wildlife Genetic Corridor	No impact.	
Vegetation	No impact.	
Wildlife	No impact.	
Game Species	No impact.	
Wetlands	No impact.	
Aquatic Biota	No impact.	
Threatened and Endangered Species	No impact.	
Land Use	Compatible with existing land use.	
Population	Will increase population at Fort Belvoir slightly.	
Housing	No impact.	
Employment	No impact.	
Income	No impact.	
Community and Army Facilities	No impact on most facilities; will generate an additional 0.72 tons per day of solid waste, will participate in recycling program.	
Traffic and Transportation	Will increase local traffic.	
Cultural Resources	Stand-structure survey needed.	
Hazardous Materials	Asbestos in building will be removed before renovation.	

Table 4-7
Comparison of Effects of Proposed BRAC Alternatives at Fort Belvoir

	BRAC 8 Material Research Facility Preferred Alternative	**BRAC 8 Material Research Facility Alternative 2**
Physiography and Topography	Final site design will minimize cut & fill.	Buildable area restricted to elevations above 125 feet MSL because of RPA requirements.
Geology and Groundwater	No impact.	No impact.
Soils	15% high water table; may present engineering constraints.	50% high water table, 20% steep slope
Surface Water	No impact.	No impact.
Climate and Air Quality	No impact.	No impact.
Wildlife Genetic Corridor	No impact; outside corridor.	No impact; outside corridor.
Vegetation	No impact.	No impact.
Wildlife	No impact.	No impact.
Game Species	No impact.	No impact.
Wetlands	No impact.	No impact.
Aquatic Biota	No impact.	No impact.
Threatened and Endangered Species	No impact.	No impact.
Land Use	Compatible with existing land use.	Compatible with existing land use.
Population	Will increase population at Fort Belvoir by approximately 200 employees.	Will increase population at Fort Belvoir by approximately 200 employees.
Housing	Will increase area demand slightly.	Will increase area demand slightly.
Employment	No impact.	No impact.
Income	Minimal (positive) effect.	Minimal (positive) effect.
Community and Army Facilities	Will increase demand on some facilities; will generate an additional 0.38 tons per day of solid waste, will participate in recycling program.	Will increase demand on some facilities; will generate an additional 0.38 tons per day of solid waste, will participate in recycling program.
Traffic and Transportation	Will increase local traffic.	Will increase local traffic.
Cultural Resources	Phase I survey needed on part of site.	Phase I and standing-structure survey needed.
Hazardous Materials	Minimal amounts of hazardous materials will be generated and disposed of according to regulations.	Minimal amounts of hazardous materials will be generated and disposed of according to regulations.

Table 4-7
Comparison of Effects of Proposed BRAC Alternatives at Fort Belvoir

	BRAC 9 Exchange Branch Preferred Alternative	**BRAC 9 Exchange Branch Alternative 2**
Physiography and Topography	Final site design will minimize cut & fill.	No impact.
Geology and Groundwater	No impact.	No impact.
Soils	No impact.	No impact.
Surface Water	No impact.	No impact.
Climate and Air Quality	No impact.	No impact.
Wildlife Genetic Corridor	No impact; outside corridor.	No impact; outside corridor.
Vegetation	No impact.	No impact.
Wildlife	No impact.	No impact.
Game Species	No impact.	No impact.
Wetlands	No impact.	No impact.
Aquatic Biota	No impact.	No impact.
Threatened and Endangered Species	No impact.	No impact.
Land Use	Change in land use from troop cantonment to community facility.	Compatible with existing land use
Population	No impact.	No impact.
Housing	No impact.	No impact.
Employment	No impact.	No impact.
Income	No impact.	No impact.
Community and Army Facilities	Will mitigate effects of BRAC (Cameron Station closure).	Will mitigate effects of BRAC (Cameron Station closure).
Traffic and Transportation	No impact.	No impact.
Cultural Resources	Phase I survey needed.	Severely disturbed, no survey needed.
Hazardous Materials	Will have underground storage tanks (fuel oils and degreasers).	Will have underground storage tanks (fuel oils and degreasers).

Table 4-7
Comparison of Effects of Proposed BRAC Alternatives at Fort Belvoir

	BRAC 10 Modify Buildings 1466 & 1445 for Base Closure Preferred Alternative	
Physiography and Topography	No impact.	
Geology and Groundwater	No impact.	
Soils	No impact.	
Surface Water	No impact.	
Climate and Air Quality	No impact.	
Wildlife Genetic Corridor	No impact; outside corridor.	
Vegetation	No impact.	
Wildlife	No impact.	
Game Species	No impact.	
Wetlands	No impact.	
Aquatic Biota	No impact.	
Threatened and Endangered Species	No impact.	
Land Use	Compatible with existing land use.	
Population	Will increase population at Fort Belvoir by approximately 206 employees.	
Housing	No impact.	
Employment	No impact.	
Income	No impact.	
Community and Army Facilities	No impact.	
Traffic and Transportation	Will increase local traffic.	
Cultural Resources	No impact.	
Hazardous Materials	Asbestos in building will be removed before renovation.	

WDCR510/004.51

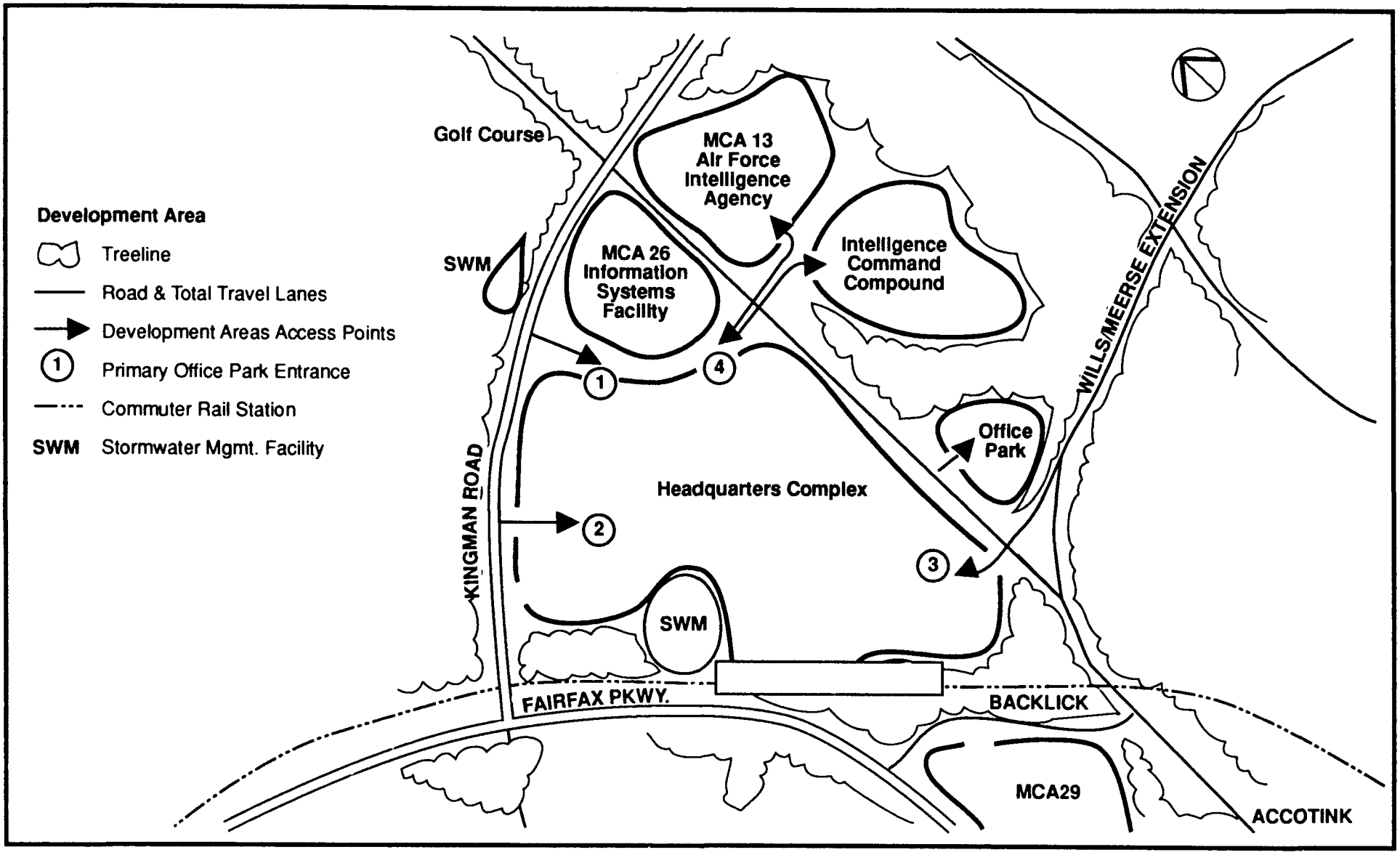


Figure 4-11
BRAC 1 Post Development Preferred Alternative, Preliminary Layout

WDC30530.RG/174.52.01/D2/03

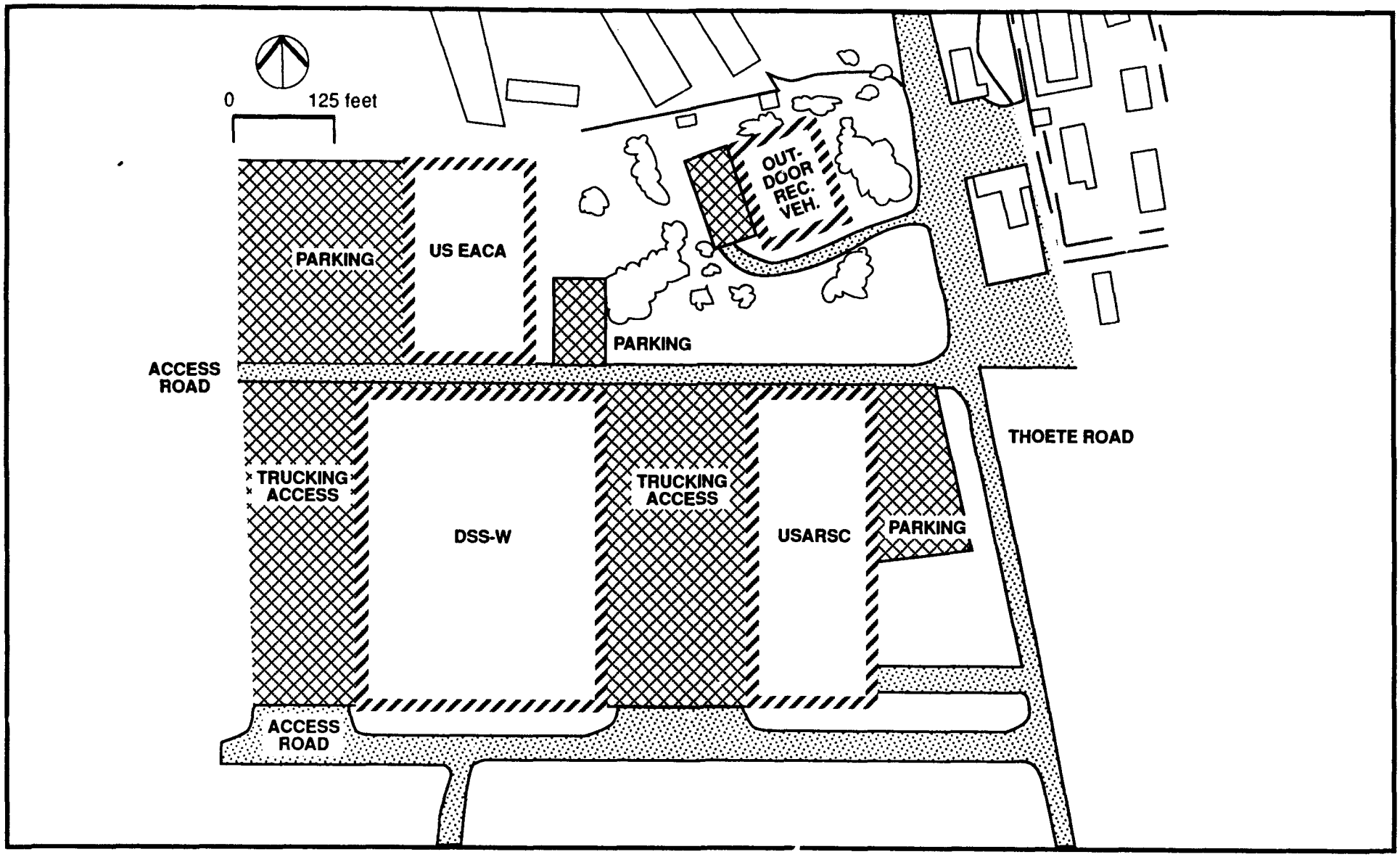


Figure 4-12
BRAC 2 Post Development Preferred Alternative

BRAC 3, North, Alternative 2 would be the construction of a four-lane road between the Fairfax County Parkway and Gunston Road. This alternative would limit access to BRAC 1 by removing Woodlawn Road as an access point which would require that all traffic accessing the site use Richmond Highway, Beulah Street, or the Fairfax County Parkway (currently Backlick Road). These roads are already heavily congested during peak periods.

The preferred alternative for BRAC 3, South, would be the construction of a two-lane road between Pohick Road and Warren Road. This would isolate the truck traffic going to and from BRAC 2.

Alternatives 1 and 2 for BRAC 3, South, would route truck traffic through the South Post on existing roads. Both of these alternatives would require substantial road improvements to ensure that the existing roads are not damaged by the truck traffic. In addition, the trucks would need to be routed near some of the housing areas that are not now affected by industrial traffic.

4.2.1.6.4 BRAC 4. The No-Action Alternative has been selected for this project because funding was withdrawn by Congress. Construction of the commissary warehouse addition would be preferred at the site for Alternative 1 because Alternative 2 is not large enough to accommodate the structure. In addition, this warehouse could support the commissary at Fort Myer. Locating the structure on the South Post would increase truck traffic in an area already congested with traffic. Construction at either site would not be expected to cause any significant environmental effects.

4.2.1.6.5 BRAC 5 and BRAC 6. Construction of both of these facilities at the preferred alternatives will create two distinct shopping areas on Fort Belvoir. It is anticipated that the North Post facility will serve primarily offpost patrons and the South Post facility will serve Fort Belvoir residents. The creation of these shopping centers should decrease traffic flows between the North Post and South Post during peak shopping hours by providing a commissary and PX in two locations.

4.2.1.6.6 BRAC 7 and BRAC 10. The preferred alternatives for both of these projects involve the renovation of vacated buildings to house activities being relocated to Fort Belvoir under P.L. 100-526. The alternative to this action would be to construct new facilities for these activities. Renovation of the existing structures is considered to be a more cost-effective alternative for BRAC 7 and 10.

4.2.1.6.7 BRAC 8. The preferred alternative for BRAC 8 locates the facility within the BRDEC area of Fort Belvoir near other facilities where similar functions are performed. This area is secure, with controlled access points. Construction of the Material Research Facility at the preferred alternative is not expected to cause any significant environmental effects.

BRAC 8, Alternative 2, is located outside the secured BRDEC area and is surrounded by wetlands, steep slopes, and RPAs. The utilities at this site would also need to be upgraded to provide adequate service. These two factors, coupled with the need to

relocate the EPG test facilities (MCA 24) to a suitable area on Fort Belvoir, eliminate this site from serious consideration for BRAC 8.

4.2.1.6.8 BRAC 9. The preferred alternative for this BRAC project located the Exchange Branch near Richmond Highway, allowing easy access foi all personnel. Alternative 2 would place BRAC 9 near the North Post shopping center in an area currently proposed for housing (AFH 3).

4.2.2 THE CONCEPT DEVELOPMENT PLAN

Table 4-8, a comparison matrix of cumulative effects, has been prepared for 37 MCA, eight NAF, one AAFES, and 13 AFH actions planned for Fort Belvoir. The five MCA and one AFH actions omitted from the table are currently under construction and have their own specific NEPA documentation. The two AAFES actions omitted from the table are still in the early planning stages and have not been formally sited and the environmental effects of these two projects could not be adequately addressed given the minimal amount of information available at the time this EIS was prepared. The table indicates the physical/chemical, biological, socioeconomic, and cultural resources that may be affected by each of the proposed actions. The following is a more detailed discussion of each of the potentially significant cumulative effects. Final analysis of the site development will identify impacts and provide appropriate investigation measures.

4.2.2.1 Physical/Chemical Resources

4.2.2.1.1 Physiography and Topography. The construction of new facilities at Fort Belvoir should have minimal effects on the existing topography. Most of the development sites are located in areas that have already been disturbed from other facilities or intensive training activities. Buildings will be sited to minimize grading and designed to complement the existing topography.

4.2.2.1.2 Geology and Groundwater. Construction of the new facilities at Fort Belvoir should have no significant effects on the existing geology because no significant subsurface activities are planned.

4.2.2.1.3 Soils. A number of actions/facilities have been proposed in soils that may present building constraints. The obstacles are in the form of regulatory constraints related to the Chesapeake Bay Preservation Act. The soil properties of concern include iron content, high water tables, and steep slopes, which also may present physical constraints to development. Hydric soils generally indicate the presence of wetlands and high water tables suggest the potential for wetland areas. According to the Chesapeake Bay Preservation Act, development is not allowed in wetland areas that are connected to waters draining into the Chesapeake Bay in Virginia. In addition, the Chesapeake Bay regulations require a buffer around these wetland areas. A buffer is also required along steep slopes ($\geq$15%) that are adjacent to wetland and deep-water areas within the Chesapeake Bay drainage basin. The only exceptions within the RPA are for water-dependent facilities. The proposed projects listed in Table 4-9 may be

Table 4-8
SUMMARY OF EFFECTS OF CONCEPT DEVELOPMENT PLAN ACTIONS AT FORT BELVOIR[a]

	MCA 6 Veterinary Clinic	MCA 7 Operations Building Renovation, Engineer School Backfill	MCA 8 Telephone Switch Upgrade
Physiography & Topography	Final site design will minimize cut & fill	No impact	No impact
Geology & Groundwater	No impact	No impact	No impact
Soils	100% high water table; possible engineering constraints	No impact	No impact
Surface Water	No impact	No impact	No impact
Climate & Air Quality	No significant impact; existing permitted incinerator to be moved	No impact	No impact
Wildlife Genetic Corridor	No impact	No impact	No impact
Vegetation	No impact	No impact	No impact
Wildlife	No impact	No impact	No impact
Game Species	No impact	No impact	No impact
Wetlands	No impact	No impact	No impact
Aquatic Biota	No impact	No impact	No impact
Threatened & Endangered Species	No impact	No impact	No impact
Land Use	Compatible with existing land use	Compatible with existing land use	No impact
Population	No impact	No impact	No impact
Housing	No impact	No impact	No impact
Employment	No impact	No impact	No impact
Income	No impact	No impact	No impact
Community & Army Facilities	No impact	No impact on most facilities; will increase solid waste generation somewhat, will participate in recycling program	Mitigation for other Concept Development Plan projects
Traffic & Transportation	No impact	No impact	No impact
Cultural Resources	Phase I survey needed	Building 201 is in Historic District; design of exterior work will be compatible with surrounding architecture	No impact
Hazardous Materials	No impact	Asbestos in building will be removed before renovation	No impact

Table 4-8
SUMMARY OF EFFECTS OF CONCEPT DEVELOPMENT PLAN ACTIONS AT FOPT BELVOIR[a]

	MCA 9 Fixed-Wing Runway Extension	MCA 10 Old Guard Horse Stables	MCA 11 Main Sewer Line Upgrade, Post-Wide
Physiography & Topography	No impact	No impact	No impact
Geology & Groundwater	No impact	No impact	No impact
Soils	No impact	25% high water table; may present siting constraint	No impact
Surface Water	No impact	No impact	No impact
Climate & Air Quality	No impact	No impact	No impact
Wildlife Genetic Corridor	No impact	Will open new hole in south end of corridor; not a critical constriction	No impact
Vegetation	Will require waiver for extensive clearing, required for runway approaches	No impact	No impact
Wildlife	No impact	No impact	No impact
Game Species	No impact	No impact	No impact
Wetlands	Preliminary assessment indicates wetlands at north end of site; permit may be required; jurisdictional delineation will be completed before construction	No impact	No impact
Aquatic Biota	No impact	No impact	No impact
Threatened & Endangered Species	No impact	No impact	No impact
Land Use	No impact	Land use category to change	No impact
Population	No impact	No impact	No impact
Housing	No impact	No impact	No impact
Employment	No impact	No impact	No impact
Income	No impact	No impact	No impact
Community & Army Facilities	No impact	No impact on most facilities; horse manure will be composted	Mitigation for other Concept Development Plan projects
Traffic & Transportation	No impact	No impact	No impact
Cultural Resources	No impact	Two archeological resource sites identified; Phase II survey ongoing	No impact
Hazardous Materials	No impact	No impact	No impact

Table 4-8
SUMMARY OF EFFECTS OF CONCEPT DEVELOPMENT PLAN ACTIONS AT FORT BELVOIR[a]

	MCA 12 North Post Fire Station	MCA 13 Headquarters, Air Force Intelligence Agency	MCA 14 Physical Fitness Center
Physiography & Topography	No impact	Topography limits buildable acreage	No impact
Geology & Groundwater	No impact	No impact	No impact
Soils	No impact	50% high water table; possible engineering constraint	No impact
Surface Water	No impact	No impact	No impact
Climate & Air Quality	No impact	No impact	No impact
Wildlife Genetic Corridor	No impact	Will cause constriction in corridor; 250- to 300-foot buffer will be required to maintain corridor south and west of the site	No impact
Vegetation	No impact	Clearing required; will comply with Fairfax County tree ordinance	No impact
Wildlife	No impact	No impact	No impact
Game Species	No impact	No impact	No impact
Wetlands	No impact	Jurisdictional delineation needed; site will be affected by RPA buffers	No impact
Aquatic Biota	No impact	No impact	No impact
Threatened & Endangered Species	No impact	No impact	No impact
Land Use	Compatible with existing land use	Compatible with existing land use	Compatible with existing land use
Population	No impact	Will increase population at Fort Belvoir by approximately 125 employees	No impact
Housing	No impact	No impact	No impact
Employment	No impact	No impact	No impact
Income	No impact	No impact	No impact
Community & Army Facilities	Mitigation for other Concept Development Plan projects	No impact on most facilities; will generate an additional 0.24 tons per day of solid waste, will participate in recycling program	No impact
Traffic & Transportation	No impact	Will increase traffic locally	No impact
Cultural Resources	May affect potential historic building; standing-structure survey will be done	No impact	May affect potential historic building; standing-structure survey will be done
Hazardous Materials	No impact	No impact	No impact

Table 4-8
SUMMARY OF EFFECTS OF CONCEPT DEVELOPMENT PLAN ACTIONS AT FORT BELVOIR[a]

	MCA 15 Virginia National Guard Armory/Headquarters (29th LID)	MCA 16 Gunston Road Extension	MCA 17 DC National Guard Hanger
Physiography & Topography	No impact	Final site design will minimize cut & fill	No impact
Geology & Groundwater	No impact	No impact	No impact
Soils	10% high water table; may be engineering constraint	27% hydric soils; 50% high water table, 2% steep slope; constraints	No impact
Surface Water	No impact	No impact	No impact
Climate & Air Quality	No impact	No impact	No impact
Wildlife Genetic Corridor	No impact	Will cut off corridor; road will be designed with box culverts to facilitate wildlife movements	No impact
Vegetation	No impact	Will require clearing along right-of-way	No impact
Wildlife	No impact	Road kills could increase; box culverts (see above) can minimize	No impact
Game Species	No impact	Same as above	No impact
Wetlands	Site may be affected by RPA buffers for offsite wetlands; jurisdictional delineation required	An Individual Section 404 permit will be required; RPA buffers will be affected	No impact
Aquatic Biota	No impact	Temporary construction impacts; BMPs will be used to minimize downstream sedimentation	No impact
Threatened & Endangered Species	No impact	Complete survey required for final right-of-way	No impact
Land Use	Compatible with existing land use	No impact	Compatible with existing land use
Population	Will increase weekend population at Fort Belvoir by approximately 500	No impact	No impact
Housing	No impact	No impact	No impact
Employment	No impact	No impact	No impact
Income	No impact	No impact	No impact
Community & Army Facilities	No impact	Will mitigate impacts caused by other Concept Development Plan projects	No impact
Traffic & Transportation	Will increase local traffic on weekends	Should improve traffic locally	No impact
Cultural Resources	Portion of site surveyed, no sites found; rest of site needs Phase I survey	Portion of site surveyed, no sites found; rest of site needs Phase I survey	No impact
Hazardous Materials	No impact	No impact	Oils, lubricants, solvents, and degreasers; disposal according to regulations

Table 4-8
SUMMARY OF EFFECTS OF CONCEPT DEVELOPMENT PLAN ACTIONS AT FORT BELVOIR[a]

	MCA 18 Seabee Operational Storage Facility	MCA 19 Renovate Heat Plant	MCA 20 Renovate Building 361 for ADP
Physiography & Topography	No impact	No impact	No impact
Geology & Groundwater	No impact	No impact	No impact
Soils	No impact	No impact	No impact
Surface Water	No impact	No impact	No impact
Climate & Air Quality	No impact	May decrease emissions when facilities are modernized	No impact
Wildlife Genetic Corridor	No impact	No impact	No impact
Vegetation	No impact	No impact	No impact
Wildlife	No impact	No impact	No impact
Game Species	No impact	No impact	No impact
Wetlands	No impact	No impact	No impact
Aquatic Biota	No impact	No impact	No impact
Threatened & Endangered Species	No impact	No impact	No impact
Land Use	Compatible with existing land use	Compatible with existing land use	Compatible with existing land use
Population	No impact	No impact	No impact
Housing	No impact	No impact	No impact
Employment	No impact	No impact	No impact
Income	No impact	No impact	No impact
Community & Army Facilities	No impact	No impact	No impact
Traffic & Transportation	No impact	No impact	No impact
Cultural Resources	No impact	No impact	No impact
Hazardous Materials	No impact	No impact	No impact

Table 4-8
SUMMARY OF EFFECTS OF CONCEPT DEVELOPMENT PLAN ACTIONS AT FORT BELVOIR[a]

	MCA 21 D.C. National Guard Academy	MCA 22 Electrical Upgrade, Post-Wide Phase I	MCA 23 Lateral Sewer Line Repair, Post-Wide
Physiography & Topography	No impact	No impact	No impact
Geology & Groundwater	No impact	No impact	No impact
Soils	90% high water table, 10% hydric soils; engineering constraints	No impact	No impact
Surface Water	No impact	No impact	No impact
Climate & Air Quality	No impact	No impact	No impact
Wildlife Genetic Corridor	No impact	No impact	No impact
Vegetation	No impact	No impact	No impact
Wildlife	No impact	No impact	No impact
Game Species	No impact	No impact	No impact
Wetlands	May be affected by RPA buffer for offsite wetlands; jurisdictional delineation required	No impact	No impact
Aquatic Biota	No impact	No impact	No impact
Threatened & Endangered Species	No impact	No impact	No impact
Land use	Compatible with existing land use	No impact	No impact
Population	Will increase weekend population at Fort Belvoir by approximately 500	No impact	No impact
Housing	No impact	No impact	No impact
Employment	No impact	No impact	No impact
Income	No impact	No impact	No impact
Community & Army Facilities	No impact	Mitigation for other Concept Development Plan projects	Mitigation for other Concept Development Plan projects
Traffic & Transportation	Will increase local traffic on weekends	No impact	No impact
Cultural Resources	Phase I survey needed	No impact	No impact
Hazardous Materials	No impact	No impact	No impact

Table 4-8
SUMMARY OF EFFECTS OF CONCEPT DEVELOPMENT PLAN ACTIONS AT FORT BELVOIR[a]

	MCA 24 Relocate EPA Test/Storage Facilities	MCA 25 Ammunition Storage	MCA 26 Information Systems Facility
Physiography & Topography	Site constrained by existing topography	No impact	No impact
Geology & Groundwater	No impact	No impact	No impact
Soils	50% high water table; 20% steep slope	80% high water table; engineering constraint	No impact
Surface Water	No impact	No impact	No impact
Climate & Air Quality	No impact	No impact	No impact
Wildlife Genetic Corridor	No impact	Will open up new hole; not a critical constriction	No impact
Vegetation	No impact	No impact	Clearing required; will comply with Fairfax County tree ordinance
Wildlife	No impact	No impact	No impact
Game Species	No impact	No impact	No impact
Wetlands	May be affected by RPA buffer for offsite wetlands; jurisdictional delineation required	No impact	Jurisdictional delineation needed; site will be affected by RPA buffers
Aquatic Biota	No impact	No impact	No impact
Threatened & Endangered Species	No impact	Just outside required bald eagle nest buffer area	No impact
Land Use	Compatible with existing land use	Compatible with existing land use	Compatible with existing land use
Population	No impact	No impact	Will increase population at Fort Belvoir by approximately 300 employees
Housing	No impact	No impact	No impact
Employment	No impact	No impact	No impact
Income	No impact	No impact	No impact
Community & army Facilities	No impact	No impact	No impact on most facilities; will generate an additional 0.6 tons per day of solid waste, will participate in recycling program
Traffic & Transportation	No impact	No impact	No impact
Cultural Resources	Phase I survey needed	No impact	Portion of project area needs a Phase I survey
Hazardous Materials	No impact	No impact	No impact

Table 4-8
SUMMARY OF EFFECTS OF CONCEPT DEVELOPMENT PLAN ACTIONS AT FORT BELVOIR[a]

	MCA 27 CIDC Field Operations Building	MCA 28 DC National Guard Cantonment	MCA 29 Main Post Library
Physiography & Topography	No impact	No impact	No impact
Geology & Groundwater	No impact	No impact	No impact
Soils	No impact	90% high water table, 10% hydric soils; engineering constraints	No impact
Surface Water	No impact	No impact	No impact
Climate & Air Quality	No impact	No impact	No impact
Wildlife Genetic Corridor	No impact	No impact	No impact
Vegetation	No impact	No impact	No impact
Wildlife	No impact	No impact	No impact
Game Species	No impact	No impact	No impact
Wetlands	No impact	May be affected by RPA buffer for offsite wetlands; jurisdictional delineation required	No impact
Aquatic Biota	No impact	No impact	No impact
Threatened & Endangered Species	No impact	No impact	No impact
Land Use	Change in land use from recreation and open space to administrative	Compatible with existing land use	Compatible with existing land use
Population	Will increase population at Fort Belvoir by approximately 60 employees	Will increase weekend population at Fort Belvoir by approximately 500	No impact
Housing	No impact	No impact	No impact
Employment	No impact	No impact	No impact
Income	No impact	No impact	No impact
Community & Army Facilities	No impact on most facilities; will generate an additional 0.1 tons per day of solid waste, will participate in recycling program	No impact	Mitigation for other Concept Development Plan projects
Traffic & Transportation	Will increase local traffic	Will increase local traffic on weekend	No impact
Cultural Resources	No impact	Phase I survey needed	Part of site needs Phase I survey; adjacent to Historic District; will do standing-structure survey
Hazardous Materials	No impact	No impact	No impact

Table 4-8
SUMMARY OF EFFECTS OF CONCEPT DEVELOPMENT PLAN ACTIONS AT FORT BELVOIR[a]

	MCA 31 Loop Road	MCA 32 Community Center/ Welcome Center	MCA 33 Facility Engineer Maintenance Shop
Physiography & Topography	Final site design will minimize cut & fill	No impact	No impact
Geology & Groundwater	No impact	No impact	No impact
Soils	18% hydric soils, 30% steep slope, 29% high water table; constraints	No impact	No impact
Surface Water	No impact	No impact	No impact
Climate & Air Quality	No impact	No impact	No impact
Wildlife Genetic Corridor	Road will be designed with bridges and box culverts to permit safe movement of wildlife within corridor	No impact	No impact
Vegetation	Will require clearing along right-of-way	No impact	No impact
Wildlife	Goes through refuge; road kills may increase, box culverts can minimize	No impact	No impact
Game Species	Same as above	No impact	No impact
Wetlands	An Individual Section 404 permit will be required; RPA buffers will be affected	No impact	No impact
Aquatic Biota	Temporary construction impacts; BMPs will be used to minimize downstream sedimentation	No impact	No impact
Threatened & Endangered Species	Complete survey required for final right-of-way	No impact	No impact
Land Use	No impact	Change in land use from troop cantonment to community facility	Compatible with existing land use
Population	No impact	No impact	No impact
Housing	No impact	No impact	No impact
Employment	No impact	No impact	No impact
Income	No impact	No impact	No impact
Community & Army Facilities	Mitigation for other Concept Development Plan projects	Mitigation for other Concept Development Plan projects	No impact
Traffic & Transportation	Should improve traffic locally	No impact	No impact
Cultural Resources	Portion of project area needs a Phase I survey	Phase I survey needed	Standing-structure survey and Phase I survey required
Hazardous Materials	No impact	No impact	Fuel oils, lubricants, solvents, and degreasers; disposal according to regulations

Table 4-8
SUMMARY OF EFFECTS OF CONCEPT DEVELOPMENT PLAN ACTIONS AT FORT BELVOIR[a]

	MCA 34 Warehouses	MCA 35 Tactical Energy Systems Lab	MCA 36 Conforming Storage Building (DRMO)
Physiography & Topography	No impact	No impact	Final site design will minimize cut & fill
Geology & Groundwater	No impact	No impact	No impact
Soils	No impact	No impact	85% high water table
Surface Water	No impact	No impact	No impact
Climate & Air Quality	No impact	No impact	No impact
Wildlife Genetic Corridor	No impact	No impact	Will open up new hole; not a critical constriction
Vegetation	No impact	No impact	No impact
Wildlife	No impact	No impact	No impact
Game Species	No impact	No impact	No impact
Wetlands	No impact	Site may be affected by RPA buffer; jurisdictional determination required	May be affected by RPA buffer for offsite wetlands; jurisdictional delineation required
Aquatic Biota	No impact	No impact	No impact
Threatened & Endangered Species	No impact	No impact	Within known range of pygmy shrew on Fort Belvoir
Land Use	Compatible with existing land use	Compatible with existing land use	Change in land use from training to service/storage
Population	No impact	No impact	No impact
Housing	No impact	No impact	No impact
Employment	No impact	No impact	No impact
Income	No impact	No impact	No impact
Community & Army Facilities	No impact	No impact	No impact
Traffic & Transportation	No impact	No impact	No impact
Cultural Resources	Adjacent to Historic District	No impact	No impact
Hazardous Materials	No impact	No impact	No hazardous wastes will be stored; hazardous materials will be handled and stored according to regulations

Table 4-8
SUMMARY OF EFFECTS OF CONCEPT DEVELOPMENT PLAN ACTIONS AT FORT BELVOIR[a]

	MCA 37 Military Police Station	MCA 38 Reserve Center/Operational Maintenance Activity (80th Div)	MCA 39 Maintenance Shop (DOL)
Physiography & Topography	No impact	No impact	No impact
Geology & Groundwater	No impact	No impact	No impact
Soils	50% high water table	No impact	No impact
Surface Water	No impact	No impact	No impact
Climate & Air Quality	No impact	No impact	No impact
Wildlife Genetic Corridor	No impact	No impact	No impact
Vegetation	No impact	No impact	No impact
Wildlife	No impact	No impact	No impact
Game Species	No impact	No impact	No impact
Wetlands	No impact	Will be affected by RPA buffers; will require nonwater-dependent facilities to be built 100 feet from the shoreline	No impact
Aquatic Biota	No impact	No impact	No impact
Threatened & Endangered Species	No impact	Boat traffic may affect nesting bald eagle in wildlife refuge	No impact
Land Use	Compatible with existing land use	Compatible with existing land use	Compatible with existing land use
Population	No impact	Will increase weekend population at Fort Belvoir by approximately 500	No impact
Housing	No impact	No impact	No impact
Employment	No impact	No impact	No impact
Income	No impact	No impact	No impact
Community & Army Facilities	Mitigation for other Concept Development Plan projects	No impact	No impact
Traffic & Transportation	No impact	Will increase weekend traffic locally	No impact
Cultural Resources	May affect potential historic building; standing-structure survey will be done	Part of site needs Phase I survey; adjacent to Historic District, will do standing-structure survey	May affect historic building, standing-structure survey will be done; disturbed, no Phase I survey needed
Hazardous Materials	No impact	No impact	Fuel oils, lubricants, solvents, and degreasers; disposal according to regulations

Table 4-8
SUMMARY OF EFFECTS OF CONCEPT DEVELOPMENT PLAN ACTIONS AT FORT BELVOIR[a]

	MCA 40 Electro-Optics Laboratory	MCA 41 Fatigue Test Facility	MCA 42[b] Potential 500-Person Administrative Facility, HEC
Physiography & Topography	No impact	No impact	Final site design will minimize cut & fill
Geology & Groundwater	No impact	No impact	No impact
Soils	No impact	No impact	20% hydric soils, 20% high water table, 20% steep slope: constraint
Surface Water	No impact	No impact	No impact
Climate & Air Quality	No impact	No impact	No impact
Wildlife Genetic Corridor	No impact	No impact	Will open new hole in north end of corridor; not a critical constriction
Vegetation	No impact	No impact	Will require clearing; will comply with Fairfax County tree ordinance
Wildlife	No impact	No impact	Will relocate to similar habitat nearby
Game Species	No impact	No impact	Will relocate to similar habitat nearby
Wetlands	No impact	No impact	Wetlands and RPA buffer on site
Aquatic Biota	No impact	No impact	No impact
Threatened & Endangered Species	No impact	No impact	No impact
Land Use	Compatible with existing land use	Compatible with existing land use	No land-use zones have been established at HEC
Population	No impact	No impact	Will increase population at HEC by approximately 500 employees
Housing	No impact	No impact	No impact
Employment	No impact	No impact	No impact
Income	No impact	No impact	No impact
Community & Army Facilities	No impact	No impact	No impact
Traffic & Transportation	No impact	No impact	Will increase traffic locally
Cultural Resources	No impact	No impact	Phase I survey needed
Hazardous Materials	No impact	No impact	No impact

Table 4-8
SUMMARY OF EFFECTS OF CONCEPT DEVELOPMENT PLAN ACTIONS AT FORT BELVOIR[a]

	AFH 2 Lewis Heights Renewal, Phase 2	AFH 3 1,500 Housing Units	AFH 4 Dogue Creek Village Renewal Phases 1 and 2
Physiography & Topography	No impact	Final site design will minimize cut & fill	No impact
Geology & Groundwater	No impact	No impact	No impact
Soils	No impact	5% hydric soils, 5% steep slopes, 55% high water table	No impact
Surface Water	No impact	Two streams on site	No impact
Climate & Air Quality	No impact	Minor effect	No impact
Wildlife Genetic Corridor	No impact	Major effect because project may create constriction if 250- to 300-foot contiguous buffer is not maintained around site	No impact
Vegetation	No impact	Major effect because project will require clearing; will comply with Fairfax County tree ordinance	No impact
Wildlife	No impact	Road kills will be increased unless BRAC 3 mitigation is implemented	No impact
Game Species	No impact	Same as above	No impact
Wetlands	No impact	Jurisdictional determination required; permits will be obtained; RPA buffers will be maintained	No impact
Aquatic Biota	No impact	Temporary construction impacts; BMPs will be used to minimize downstream sedimentation	No impact
Threatened & Endangered Species	No impact	Major because wood turtles could be affected	No impact
Land Use	No impact	Compatible with existing land use	No impact
Population	No impact	Major effect because project will increase Fort Belvoir population by approximately 4,500 residents	No impact
Housing	No impact	Provides housing for military personnel stationed in region	No impact
Employment	No impact	No impact	No impact
Income	No impact	No impact	No impact
Community & Army Facilities	No impact	Will increase demand on local and post facilities; will generate 8.75 tons per day of solid waste, will participate in recycling program	No impact
Traffic & Transportation	No impact	Major effect because project will increase local traffic road network needed	No impact
Cultural Resources	No impact	Phase I survey needed	No impact
Hazardous Materials	No impact	No impact	No impact

Table 4-8
SUMMARY OF EFFECTS OF CONCEPT DEVELOPMENT PLAN ACTIONS AT FORT BELVOIR[a]

	AFH 5 George Washington Village Whole-House Renewal	AFH 6 River Village Whole-House Renewal	AFH 7 Belvoir Village Whole-House Renewal
Physiography & Topography	No impact	No impact	No impact
Geology & Groundwater	No impact	No impact	No impact
Soils	No impact	No impact	No impact
Surface Water	No impact	No impact	No impact
Climate & Air Quality	No impact	No impact	No impact
Wildlife Genetic Corridor	No impact	No impact	No impact
Vegetation	No impact	No impact	No impact
Wildlife	No impact	No impact	No impact
Game Species	No impact	No impact	No impact
Wetlands	No impact	No impact	No impact
Aquatic Biota	No impact	No impact	No impact
Threatened & Endangered Species	No impact	No impact	No impact
Land Use	No impact	No impact	No impact
Population	No impact	No impact	No impact
Housing	No impact	No impact	No impact
Employment	No impact	No impact	No impact
Income	No impact	No impact	No impact
Community & Army Facilities	No impact	No impact	No impact
Traffic & Transportation	No impact	No impact	No impact
Cultural Resources	No impact	No impact	In Historic District; exterior renovations must be compatible with Historic District architecture
Hazardous Materials	No impact	No impact	No impact

Table 4-8
SUMMARY OF EFFECTS OF CONCEPT DEVELOPMENT PLAN ACTIONS AT FORT BELVOIR[a]

	AFH 8 Gerber Village Whole-House Renewal	AFH 9 Visiting Officers Quarters Renovation	AFH 10 Jadwin Loop Whole-House Renewal
Physiography & Topography	No impact	No impact	No impact
Geology & Groundwater	No impact	No impact	No impact
Soils	No impact	No impact	No impact
Surface Water	No impact	No impact	No impact
Climate & Air Quality	No impact	No impact	No impact
Wildlife Genetic Corridor	No impact	No impact	No impact
Vegetation	No impact	No impact	No impact
Wildlife	No impact	No impact	No impact
Game Species	No impact	No impact	No impact
Wetlands	No impact	No impact	No impact
Aquatic Biota	No impact	No impact	No impact
Threatened & Endangered Species	No impact	No impact	No impact
Land Use	No impact	No impact	No impact
Population	No impact	No impact	No impact
Housing	No impact	No impact	No impact
Employment	No impact	No impact	No impact
Income	No impact	No impact	No impact
Community & Army Facilities	No impact	No impact	No impact
Traffic & Transportation	No impact	No impact	No impact
Cultural Resources	In Historic District; exterior renovations must be compatible with Historic District architecture	No impact	In Historic District; exterior renovations must be compatible with Historic District architecture
Hazardous Materials	No impact	No impact	No impact

Table 4-8
SUMMARY OF EFFECTS OF CONCEPT DEVELOPMENT PLAN ACTIONS AT FORT BELVOIR[a]

	AFH 11 Colyer Village Whole-House Renewal	AFH 12 Rossell Loop Whole-House Renewal	AFH 13 Woodlawn Village Whole-House Renewal
Physiography & Topography	No impact	No impact	No impact
Geology & Groundwater	No impact	No impact	No impact
Soils	No impact	No impact	No impact
Surface Water	No impact	No impact	No impact
Climate & Air Quality	No impact	No impact	No impact
Wildlife Genetic Corridor	No impact	No impact	No impact
Vegetation	No impact	No impact	No impact
Wildlife	No impact	No impact	No impact
Game Species	No impact	No impact	No impact
Wetlands	No impact	No impact	No impact
Aquatic Biota	No impact	No impact	No impact
Threatened & Endangered Species	No impact	No impact	No impact
Land Use	No impact	No impact	No impact
Population	No impact	No impact	No impact
Housing	No impact	No impact	No impact
Employment	No impact	No impact	No impact
Income	No impact	No impact	No impact
Community & Army Facilities	No impact	No impact	No impact
Traffic & Transportation	No impact	No impact	No impact
Cultural Resources	No impact	No impact	No impact
Hazardous Materials	No impact	No impact	No impact

Table 4-8
SUMMARY OF EFFECTS OF CONCEPT DEVELOPMENT PLAN ACTIONS AT FORT BELVOIR[a]

	AFH 14 Fairfax Village Whole-House Renewal	NAF 1 Youth Center	NAF 2 Tompkins Basin Armed Forces Recreation Area
Physiography & Topography	No impact	No impact	Site layout will be designed around topography
Geology & Groundwater	No impact	No impact	No impact
Soils	No impact	No impact	20% high water table, 80% steep slopes; engineering constraints
Surface Water	No impact	No impact	BMPs will be used to control erosion
Climate & Air Quality	No impact	No impact	No impact
Wildlife Genetic Corridor	No impact	No impact	No impact
Vegetation	No impact	No impact	Will require clearing; will comply with Fairfax County tree ordinance
Wildlife	No impact	No impact	No impact
Game Species	No impact	No impact	No impact
Wetlands	No impact	No impact	Site design will incorporate RPA buffers
Aquatic Biota	No impact	No impact	Temporary impacts from turbidity caused by dredging
Threatened & Endangered Species	No impact	No impact	Boat traffic may affect nesting bald eagle in wildlife refuge
Land Use	No impact	Compatible with existing land use	Compatible with existing land use
Population	No impact	No impact	Will increase Fort Belvoir population using recreation area on weekends
Housing	No impact	No impact	No impact
Employment	No impact	No impact	No impact
Income	No impact	No impact	No impact
Community & Army Facilities	No impact	No impact	Facility provided to reduce demand on other park recreational facilities; will increase solid waste generation
Traffic & Transportation	No impact	No impact	Will increase traffic locally on weekends
Cultural Resources	No impact	Needs Phase I survey and standing-structure survey	Phase I & II surveys done; 2 sites identified; 44FX1328-eligible for NRHP, 44FX1654-Phase II ongoing
Hazardous Materials	No impact	Asbestos will be removed from existing structures before demolition	No impact

Table 4-8
SUMMARY OF EFFECTS OF CONCEPT DEVELOPMENT PLAN ACTIONS AT FORT BELVOIR[a]

	NAF 3 Horse Stables	NAF 4 Benyuard Pool Addition	NAF 5 Golf Course
Physiography & Topography	No impact	No impact	Large areas with steep slopes, severe engineering constraints
Geology & Groundwater	No impact	No impact	No impact
Soils	25% high water table	No impact	10% hydric soils, 35% high water table, 40% steep slopes; constraints
Surface Water	No impact	No impact	Will need to comply with RPA buffer requirements
Climate & Air Quality	No impact	No impact	No impact
Wildlife Genetic Corridor	No impact	No impact	Will almost completely severe the corridor unless 250- to 300-foot contiguous buffers are maintained around the site
Vegetation	No impact	No impact	Will require clearing; will comply with Fairfax County tree ordinance
Wildlife	No impact	No impact	Buffers (see above) should protect nesting barred owl, Cooper's hawk
Game Species	No impact	No impact	No impact
Wetlands	No impact	No impact	Individual Section 404 permit will be required
Aquatic Biota	No impact	No impact	Herbicides and pesticides may decrease diversity and populations
Threatened & Endangered Species	No impact	No impact	No impact
Land Use	Change in land use	No impact	Change from administrative use; adjacent to land zoned recreational
Population	No impact	No impact	No impact
Housing	No impact	No impact	No impact
Employment	No impact	No impact	No impact
Income	No impact	No impact	No impact
Community & Army Facilities	No impact on most facilities; horse manure will be composted	Mitigation for other Concept Development Plan projects	Will alleviate demand on other recreational facilities in the area; will increase generation of solid waste somewhat
Traffic & Transportation	No impact	No impact	Will increase traffic locally on weekends
Cultural Resources	Two archeological resource sites identified; Phase II survey ongoing	No impact	Part of site needs Phase I survey; previous survey identified 44FX673-needs Phase II survey.
Hazardous Materials	No impact	No impact	Pesticides and herbicides will be used in accordance with regulations

Table 4-8
SUMMARY OF EFFECTS OF CONCEPT DEVELOPMENT PLAN ACTIONS AT FORT BELVOIR[a]

	NAF 6 Corporate Fitness Center	NAF 7 Child Development Center	NAF 8 Temporary Lodging Facility
Physiography & Topography	No impact	Final site design will minimize cut & fill	No impact
Geology & Groundwater	No impact	No impact	No impact
Soils	No impact	No building constraints	75% high water table
Surface Water	No impact	Ephemeral stream on site	No impact
Climate & Air Quality	No impact	No impact	No impact
Wildlife Genetic Corridor	No impact	Will constrict corridor; site design will include 250- to 300-foot vegetated buffer to maintain corridor	No impact
Vegetation	No impact	No impact	No impact
Wildlife	No impact	No impact	No impact
Game Species	No impact	No impact	No impact
Wetlands	No impact	Preliminary screening; no wetlands on site; jurisdictional delineation will be done before construction; no effects on RPA buffers	No impact
Aquatic Biota	No impact	No impact	No impact
Threatened & Endangered Species	No impact	No impact	No impact
Land Use	No impact	Compatible with existing land use	Compatible with existing land use
Population	No impact	No impact	No impact
Housing	No impact	No impact	No impact
Employment	No impact	No impact	No impact
Income	No impact	No impact	No impact
Community & Army Facilities	Will alleviate demand on other recreational facilities in the area	Mitigation for other Concept Development Plan projects	No impact on most facilities; will increase solid waste generation somewhat
Traffic & Transportation	No impact	No impact	No impact
Cultural Resources	Needs Phase I survey	Needs Phase I survey	Disturbed, no survey necessary; visual resources: close to Route 1, will follow installation design guide
Hazardous Materials	No impact	No impact	No impact

Table 4-8
SUMMARY OF EFFECTS OF CONCEPT DEVELOPMENT PLAN ACTIONS AT FORT BELVOIR[a]

	AAFES 1 Fast Food Facility (Burger King)	
Physiography & Topography	No impact	
Geology & Groundwater	No impact	
Soils	No impact	
Surface Water	No impact	
Climate & Air Quality	No impact	
Wildlife Genetic Corridor	No impact	
Vegetation	No impact	
Wildlife	No impact	
Game Species	No impact	
Wetlands	No impact	
Aquatic Biota	No impact	
Threatened & Endangered Species	No impact	
Land Use	Compatible with existing land use	
Population	No impact	
Housing	No impact	
Employment	No impact	
Income	No impact	
Community & Army Facilities	No impact on most facilities; will alleviate increased demand on existing food services; will increase solid waste generation	
Traffic & Transportation	No impact	
Cultural Resources	No impact	
Hazardous Materials	No impact	

Note: Population figures are approximate and will fluctuate over time.
[a]Projects already under construction, MCAs 1-5 and AFH 1 and projects not yet sited, AAFESs 2 and 3, are not included.
[b]Included for cumulative impact analysis

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Table 4-9
DEVELOPMENTAL CONSTRAINTS OF PROPOSED CDP PROJECTS AT FORT BELVOIR

Action/Facility	Building Constraint
MCA 6	100% high water table
MCA 10	25% high water table
MCA 13	50% high water table
MCA 15	10% high water table
MCA 16	27% hydric soil/50% high water table/2% steep slopes
MCA 21	10% hydric soil/90% high water table
MCA 24	50% high water table/20% steep slopes
MCA 25	80% high water table
MCA 28	10% hydric soil/90% high water table
MCA 31	18% hydric soil/29% high water table/30% steep slopes
MCA 36	85% high water table
MCA 37	50% high water table
MCA 42	10% hydric soil/20% high water table/20% steep slopes
AFH 3	5% hydric soil/55% high water table/5% steep slopes
NAF 2	20% high water table/80% steep slopes
NAF 3	25% high water table
NAF 5	10% hydric soil/35% high water table/40% steep slopes
NAF 8	75% high water table

located in an RPA. This table identifies potential developmental constraints that will be considered in the siting and design process. Further field analysis may be required to accurately determine if these proposed activities are indeed affected by these physical conditions. The constraints will be analyzed during the detailed design phase of each project in order to minimize impacts to the RPA.

4.2.2.1.4 Surface Water. As most of the proposed sites are essentially upland, they should have minimal effects on surface water quality. Any effects on surface water from stormwater flows and soil erosion should be temporary. BMPs will be used to reduce the potential for significant impacts from increased sedimentation, nutrient levels, and other sediment-associated contaminants. Those sites that have surface water

features nearby will be separated by the required RPA buffer, which should minimize any effects these sites would have on surface water quality. Sedimentation control will be performed in compliance with the *Virginia Erosion and Sedimentation Control Handbook*, and sites will be provided with adequate stormwater management. In areas developed within the RMA, best management practices will be used to control stormwater and sediments.

As discussed in Section 4.2.2.1.2 above, Fort Belvoir has management programs that are designed to protect the quality of surface water. The post's SPCC plan ensures that the potential for accidental releases is reduced and that if they should occur, they can be quickly contained and cleaned up.

The Tompkins Basin Armed Forces Recreation Area (NAF 2) and the Reserve Center/ OMA (80th DIV) (MCA 38) have the potential to affect surface water quality through the proposed shoreline development and channel dredging for the marina. Development of both projects could affect the physical and chemical quality of Gunston Cove and adjacent waters by 1) introducing sediments and nutrients into the water during construction and by actions that cause soil erosion on the site; 2) introducing sediments, and contaminants associated with the sediments, into the water from the dredging and the dredged material placement necessary for construction of the proposed marinas; 3) changing water currents and sediment transport in Gunston Cove by the construction of the breakwater for the proposed marinas, and 4) introducing pollutants, specifically oil and gas, into the water from boating operations.

Fort Belvoir is committed to using appropriate techniques for preventing erosion from the site during construction and maintenance of NAF 2 in order to minimize the introduction of sediments to adjacent waters. The proposed breakwater will be designed to minimize any changes to sedimentation patterns within the marina. Therefore, the effects of sediment transport will be minimized. Runoff from the development may add nutrients in the form of fertilizers, herbicides, and pesticides to the cove; Fort Belvoir can minimize this by limiting the use of fertilizers, especially in the floodplains, and by using other BMPs as prescribed by the Virginia Soil Conservation Service.

The severity of the dredging impacts on water quality will depend on the method used for dredging; some dredging techniques promote greater turbidity than others. A separate environmental assessment of dredging techniques and disposal sites will be prepared to determine the method that minimizes environmental impacts to the greatest extent possible and is still economically feasible. This study will evaluate available dredging methods and will evaluate these methods for potential effects on water quality, efficacy for Gunston Cove sediments, and compatibility with the planned disposal of the dredged material. Fort Belvoir will be required to obtain permits from the Army Corps of Engineers and the Commonwealth of Virginia Marine Resources Commission for the dredging and other construction that would take place in tidal wetlands or in waters of the United States and Virginia.

Results of the chemical analyses conducted on the sediments of Gunston Cove (Table 4-10) suggest that no deleterious levels of heavy metals will be introduced by the dredging activities. Because the sediments comprise mostly silt, a compatible site for disposal must be identified. Temporary effects to water quality may occur from the introduction of silt into the water column during dredging activities; however, no toxins are associated with these sediments.

The areal extent of substrate and the depth of sediments to be dredged also determine the severity of dredging effects on water quality and the feasibility of disposal of the dredged material. The preliminary estimate indicates that approximately 21,000 cubic yards of material will be dredged and disposed of to construct the proposed marina facilities. Dredging will take place solely to allow access to the marina facilities; no dredging will occur near the shoreline adjacent to the boardwalk and piers near the proposed restaurant.

The discharge of oil into or upon the waters of Virginia is prohibited by law (Section 62.1 of the Virginia Code). Fort Belvoir plans to minimize the chance that an accidental spill could occur through site design and through coordinated management with Fort Belvoir's Environmental and Natural Resources Division. No fuel pumps are planned for the marina.

Fort Belvoir will use a breakwater designed to protect the boat slips, but not accumulate sediments. Such a design will minimize the trapping of sediments borne by outgoing waters. Fort Belvoir is committed to protecting the shoreline of Gunston Cove and Accotink Bay, and will therefore limit shoreline construction to those features that are necessary for operation of the marina. Fort Belvoir will use appropriate vegetation to stabilize the shoreline and to revegetate remaining areas that have experienced erosion as a result of wave energy and training activities.

NAF 5 also has the potential to affect surface water quality on the post. Golf courses traditionally use concentrations of herbicides, pesticides, fungicides, and fertilizers to maintain tees, fairways, and greens. However, an EPA-reviewed plan for an integrated pest management program will be developed during the design phase of NAF 5. The plan will evaluate design options such as recycling irrigation water and the establishment and maintenance of a 200-foot, chemical-free buffer along drainages. The plan will also examine ways to minimize chemical applications during maintenance operations. The plan will be implemented when construction begins.

Additional background information relating to surface water impacts can be found in the ongoing *Environmental Assessment: Tompkins Basin Recreational Area, Fort Belvoir, Virginia* (RGH, 1990) and *Environmental Assessment: U.S. Army 1,000-Man Reserve Center, Fort Belvoir, Virginia* (RGH, 1990).

4.2.2.1.5 Climate and Air Quality. The construction and relocation of the new facilities and activities is not expected to have any effect on climate, nor is climate expected to have a significant effect on the activities.

Table 4-10
CHARACTERISTICS OF SEDIMENT SAMPLES COLLECTED IN GUNSTON COVE

Parameters	Units	COE Guidelines	Sampling Stations							
			Deep Water Sites				Shallow Water Sites			
			1	2	3	4	5	6	7	8
Chemical Oxygen Demand	mg/kg	100,000	14,000	1,900	26,000	29,000	26,000	9,800	23,000	9,500
Oil and Grease	mg/kg	5,000	2,900	650	3,200	1,100	8,900	860	6,200	130
Total Organic Carbon	mg/kg	20,000	3,300	7,700	5,600	3,200	7,000	1,500	3,200	1,700
Cadmium	mg/kg	2	<0.40	<0.42	<0.37	<0.30	<0.38	<0.29	<0.41	<0.38
Chromium, Total	mg/kg	80	8.2	18.2	16	15	13.3	9.8	11.7	3.3
Copper	mg/kg	80	8.8	16.9	15.4	14.7	12.1	3.4	10.3	4.5
Lead	mg/kg	100	25.9	32.5	31.1	30.6	22.8	8.3	26.6	13.4
Mercury	mg/kg	1	<0.13	<0.12	0.19	0.14	0.17	<0.11	<0.11	<0.11
Nickel	mg/kg	NA	7.2	84.4	13.3	13.9	12.3	3.2	8.5	2.8
Zinc	mg/kg	300	38.6	89.3	70.4	71.4	67.2	16.2	17.8	20.2
Total Kjeldahl Nitrogen	mg/kg	2,500	670	1,200	1,100	1,200	870	160	1,000	570
Total Phosphorus	mg/kg	2,500	15	13	19	18	20	7.1	16	25
Total Volatile Residue	%	11	0.9	6.2	3.3	6.1	7.4	4.2	5.1	1.2
Specific Gravity	25C/25C	NA	1.8	1.3	1.5	1.4	1.2	1.7	1.3	1.9
Grain Size (Percent by weight finer than silt)	%	NA	74	58	56	37	53	10	57	10

The modernization of the heating plant (MCA 19) should lower emissions somewhat when the old boilers are replaced with more efficient, cleaner-burning units.

The construction of MCA 6 will require that the permitted incinerator, which was part of the original facility, be designed into the new structure. No significant impacts are expected from this facility.

Air quality impacts can also occur during construction activities when wind-blown particulates are transported. Vegetation and surface waters can be affected. Likewise, the nuisance particulates can affect ventilation systems in existing buildings as well as people working downwind. Dust control should be implemented using BMPs, such as the wetting of sites where vegetation has been removed and grading has occurred. This should help reduce windblown particulates.

4.2.2.2 Biological Resources

4.2.2.2.1 Terrestrial Biota. Most of the sites designated for development at Fort Belvoir should not significantly affect biological resources because they are located in areas that are either heavily disturbed from training activities or already developed for other purposes. As a result, only those activities from which potentially significant impacts are expected are discussed below.

4.2.2.2.1.1 Wildlife Genetic Corridor. The construction of AFH 3 is expected to have the greatest impact on the genetic corridor (Figure 4-13). This project is located within a constriction below the North Eighteen Golf Course. Site development here could virtually eliminate all of the remaining unfenced wooded corridor. While the remaining golf course green space would allow passage for some species, many small animals and reptiles are reluctant to venture into the open (Ernst, et al., 1990) and their southwestern distribution and dispersal may be inhibited by development at the AFH 3 site. A 250- to 300-foot contiguous buffer composed of existing native vegetation, and additional planting as required, will be maintained between the proposed development and the golf course. This width has been shown to be the minimum required to allow movements of species (Johnson, 1986 & Jones, 1986).

MCA 16 and 31 could also have a detrimental effect upon species attempting to disperse across these roadways. The issues for MCAs 16 and 31 are similar to those discussed for BRACs 1 and 3 in Section 4.2.1.2.1.1.

Construction of NAF 5 and its associated service roads will adhere to the limitations and constraints outlined in *Environmental Assessment: Relocation of Headquarters, U.S. Army Materiel Command to Fort Belvoir, Virginia* (RGH, 1988) to minimize effects on the corridor in this area. Figure 4-14 shows the post-development corridor boundary at NAF 5.

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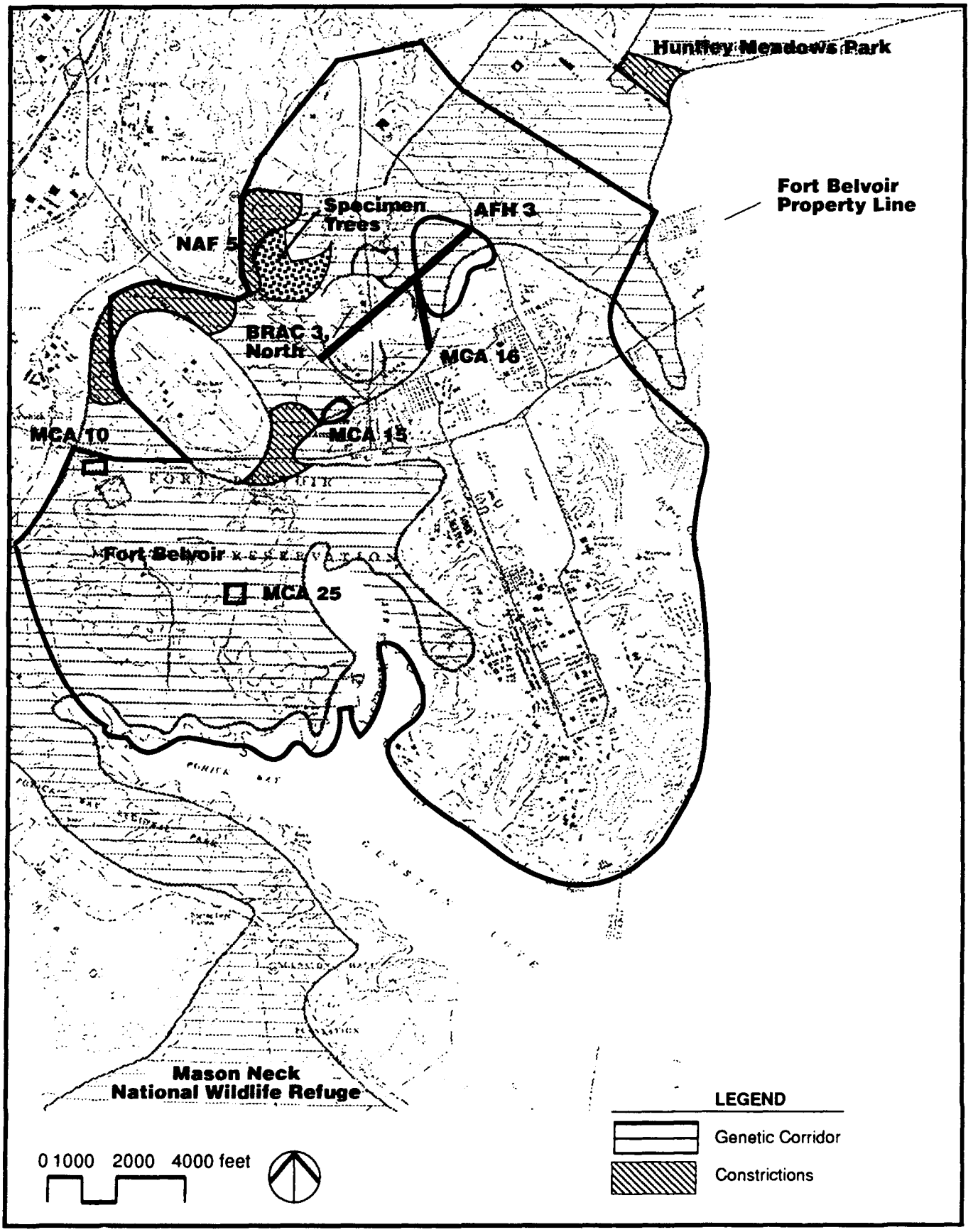


Figure 4-13
Impacts to the Genetic Corridor Alignment and Critical Constrictions on Fort Belvoir

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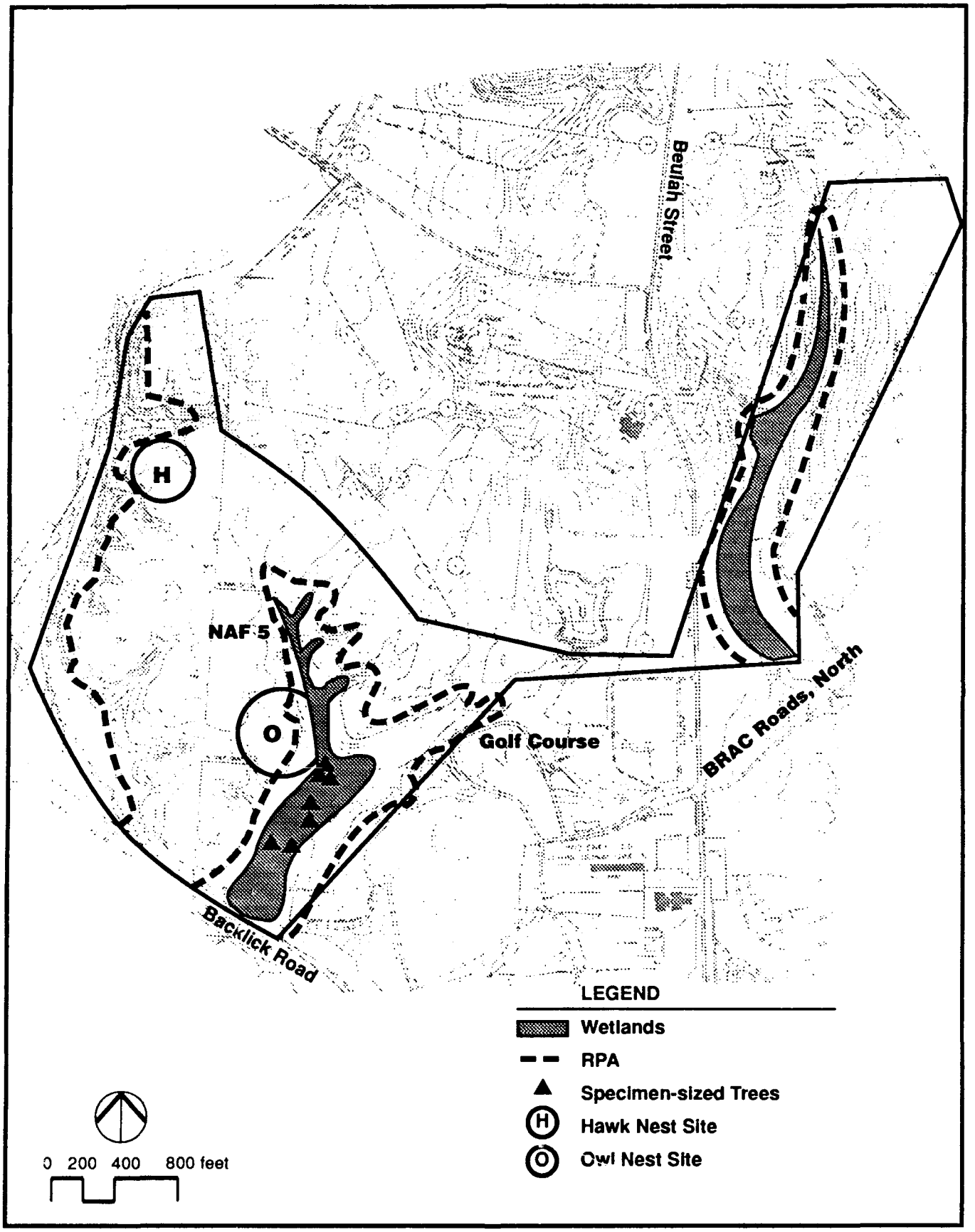


Figure 4-14
NAF 5
Environmental Constraints

Both MCA 15 and MCA 26 are sited near a critical wildlife corridor constriction between Accotink Village and Davison Airfield. Future construction in this area should be minimized to avoid completely severing the corridor.

MCA 10 will open a new hole in a broad area of the corridor. The proximity to Richmond Highway will minimize the area available for future construction. Currently, the corridor connections at Richmond Highway are limited to the area surrounding Davison Airfield. Future construction east of MCA 10 should be carefully studied to ensure that the corridor will not be severed.

As with MCA 10, MCA 25 will open up a new hole within the corridor. However, the isolated nature of this site minimizes the effect the construction of this project in the corridor. The new hole is not in a critical area of the corridor.

Individually, each of the projects discussed above will not have a significant effect on the corridor. However, collectively, the projects sited north of Backlick Road will have a significant effect on the corridor. In order to minimize these effects, Fort Belvoir will prepare a genetic corridor management plan as part of the update to the *Fort Belvoir Natural Resources Management Plan* (April, 1983).

4.2.2.2.1.2 Vegetation. Although all of the sites discussed above will require clearing of indigenous vegetation, AFH 3 and NAF 5 will require the largest amount of clearing. *The Environmental Assessment: Relocation of Headquarters, U.S. Army Materiel Command to Fort Belvoir, Virginia* (RGH, 1988) outlined areas that contained specimen-sized trees that should be saved. Figure 4-14 shows the locations of these trees as well as other environmental constraints for the NAF 5 site.

Because the scope of AFH 3 is large (1,500 housing units), it could necessitate clearing large areas. To the extent possible, native vegetation will be saved. This could provide screening from other structures, as well as habitat for animal species. Multiple dwellings or apartments can further reduce impacts by concentrating more housing units in a smaller area than would be required by detached or semi-detached dwellings.

For all of the projects, Fort Belvoir will comply with the recently passed Fairfax County tree ordinance by maximizing canopy areas at development sites. Revegetation for landscaping purposes should incorporate the planting of indigenous species to increase the chances for successful establishment and to reduce the likelihood of failure from drought or other climatic conditions. Landscaping plans should also require the use of species that currently provide most of the material used by wildlife on the post.

4.2.2.2.1.3 Wildlife. Although the projects discussed in Section 4.2.2.2.1.1 will have an effect on the movements of terrestrial species, most of the proposed disturbances will not significantly affect habitats at Fort Belvoir. Some of the animals displaced by construction will relocate into the remaining woodland. Competition for food and territories could stress the populations, however. In addition, some area-sensitive species (barred owl, ovenbird, Cooper's hawk, pileated woodpecker, etc.) could be lost from some areas of the North Post as their remaining habitat is further fragmented. Impacts

to nesting Cooper's hawks and barred owls on NAF 5 will be reduced by retaining the buffers shown on Figure 4-14. These nesting sites, along with others on Fort Belvoir, will be protected by the *Fort Belvoir Natural Resources Management Plan*.

4.2.2.2.1.4 Game Species. None of the proposed actions should have a significant effect on the whitetail deer population provided that the mitigation measures to reduce road kills outlined in the discussion of the wildlife genetic corridor (Sections 4.2.1.2.1.1 and 4.2.2.2.1.1) are implemented.

4.2.2.2.2 Wetlands. Wetlands are protected by the Clean Water Act, and impacts to this resource should be minimal. However, initial site surveys indicate that large areas of wetlands are associated with both the NAF 5 and AFH 3 sites (Figures 4-14 and 4-15). Both NAF 5 and AFH 3 will be designed to avoid affecting wetlands and to conform to the President's goal of no net loss of wetlands. Jurisdictional wetland delineations will be completed and the required permits obtained before construction begins in these areas.

The following additional sites also contain wetlands either on the site or immediately adjacent to the site: NAF 2, and MCAs 9, 13, 15, 21, 24, 28, 31, and 42. Figures 4-16 through 4-22 show the environmental constraints for these sites. Site layouts will be designed to avoid all wetlands and minimize impacts with a goal of no net loss of wetlands.

In addition to the wetlands issue, a number of projects will be affected by the Chesapeake Bay Preservation Act enacted by the Virginia General Assembly in 1989. The act was discussed in Section 4.2.1.2.2. Approximate RPA buffers for AFH 3, NAF 2, and NAF 5 are shown on Figures 4-15, 4-16, and 4-14, respectively. It must be noted that detailed field delineations are required to accurately define the wetlands and the buffer boundaries. This work has been initiated by the Army. In addition, MCAs 3, 9, 13, 16, 31, and 42 could be affected by the RPA requirements of either onsite or adjacent offsite wetlands. This will be determined once site-specific jurisdictional wetland delineations are completed for these sites.

4.2.2.2.3 Aquatic Biota. Most of the proposed sites are upland and should have minimal effects on aquatic biota. Sedimentation control will be performed in compliance with the *Virginia Erosion and Sediment Control Handbook*. Fort Belvoir will incorporate a regional stormwater management program to accommodate stormwater runoff from all proposed activities. Areas developed within the RMA will have adequate BMPs to control stormwater and sediments.

NAF 2 and MCA 38 have the greatest potential to impact the aquatic biota because they are sited on Gunston Cove and dredging is proposed to create a channel to the Potomac River for a marina. Impacts associated with this project include increased amounts of suspended sediments immediately after dredging, which may result in some temporary dispersal of fish populations and loss of diversity until the sediments settle. Some shallow water habitat will be lost, but not enough to be detrimental to the

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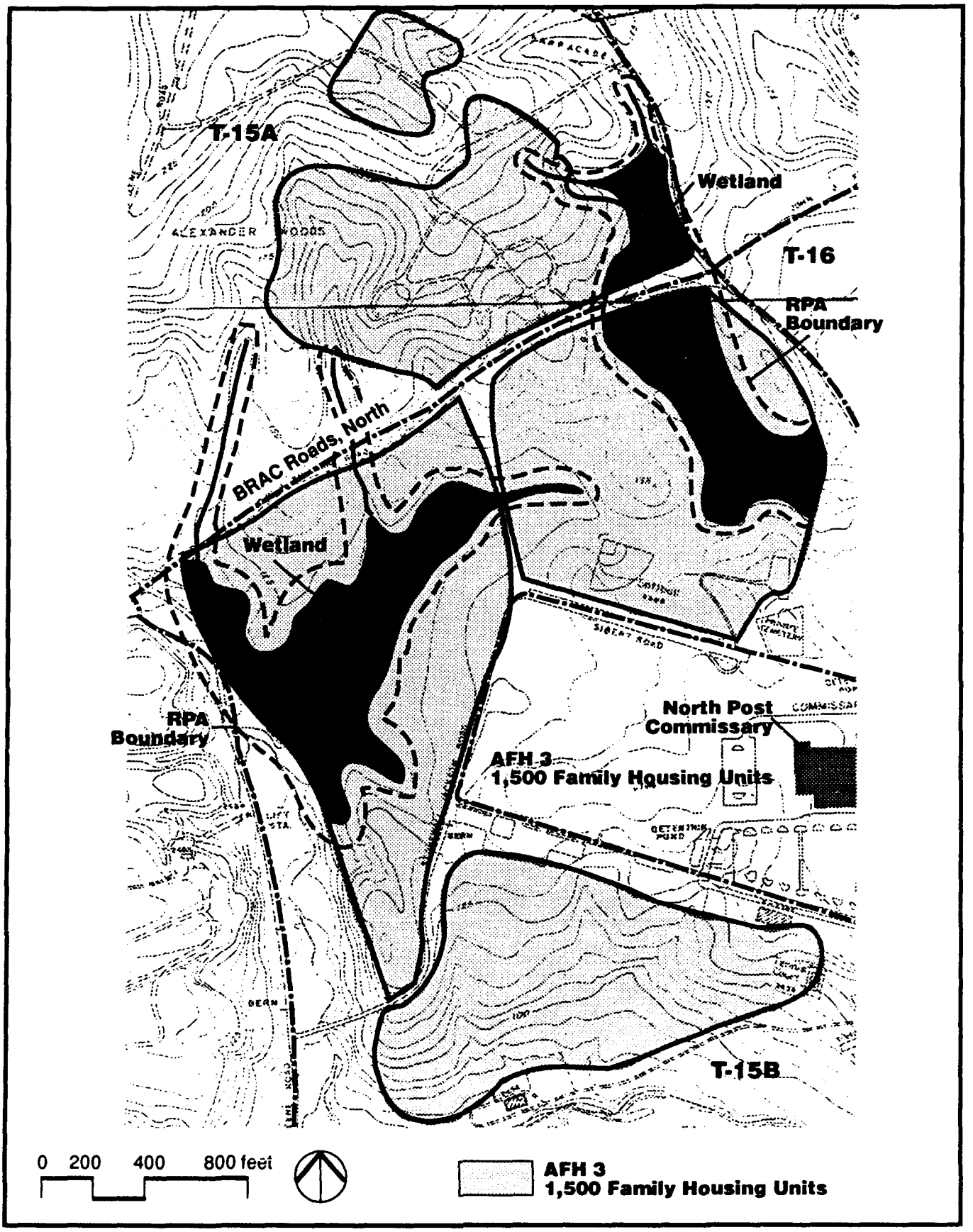


Figure 4-15
AFH 3
Environmental Constraints

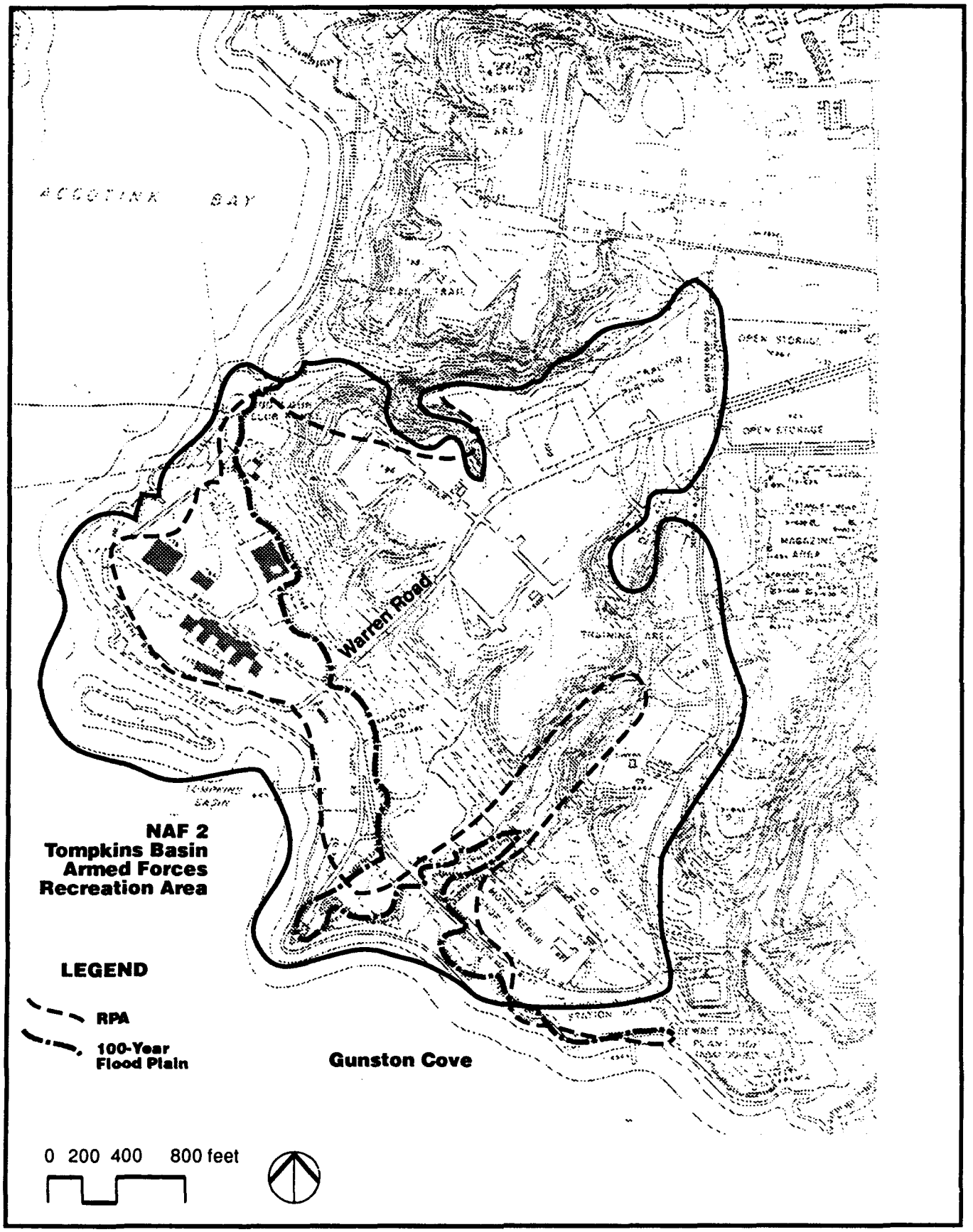


Figure 4-16
NAF 2
Environmental Constraints

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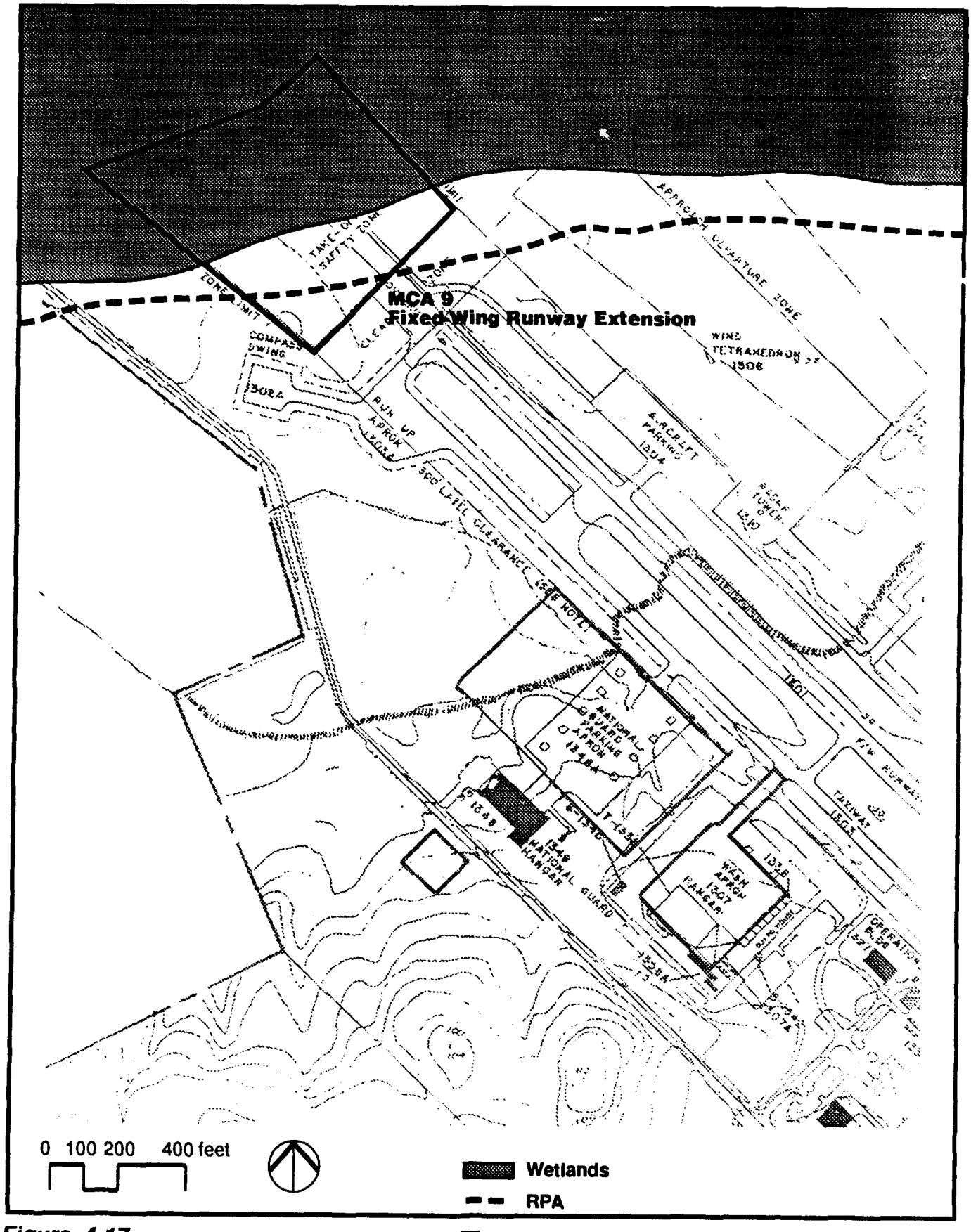


Figure 4-17
MCA 9
Environmental Constraints

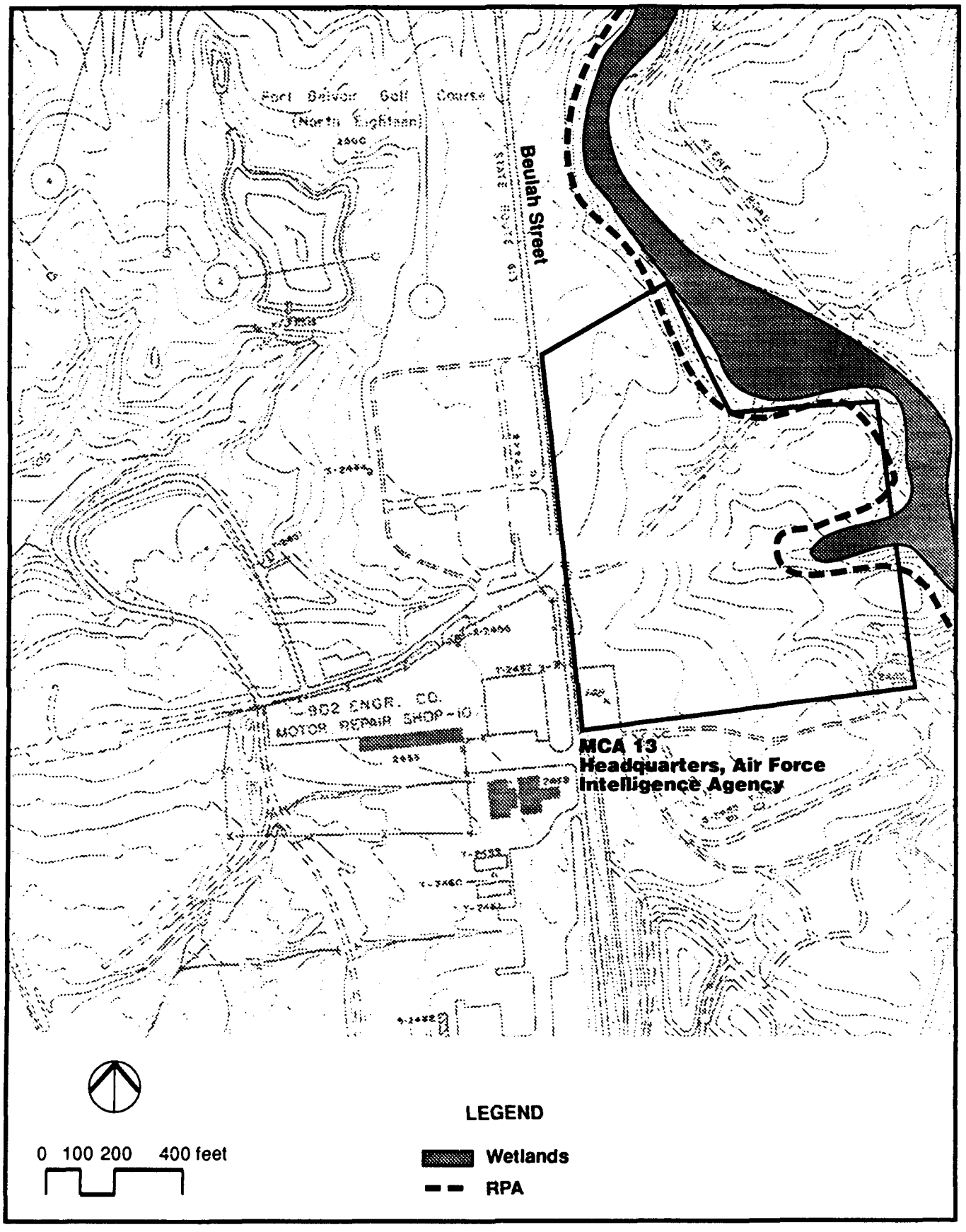


Figure 4-18
MCA 13
Environmental Constraints

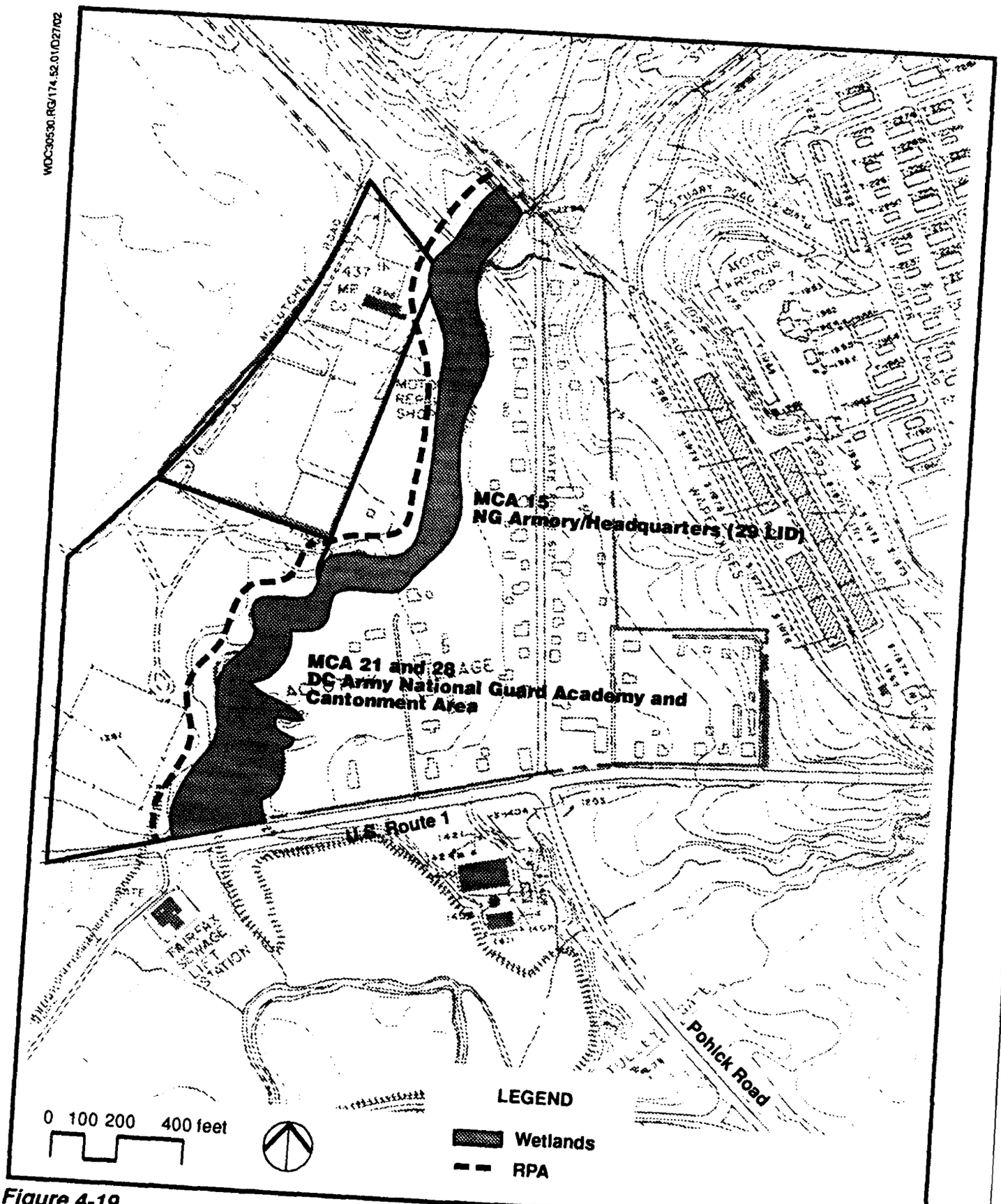


Figure 4-19
MCA 15, 21, and 28
Environmental Constraints

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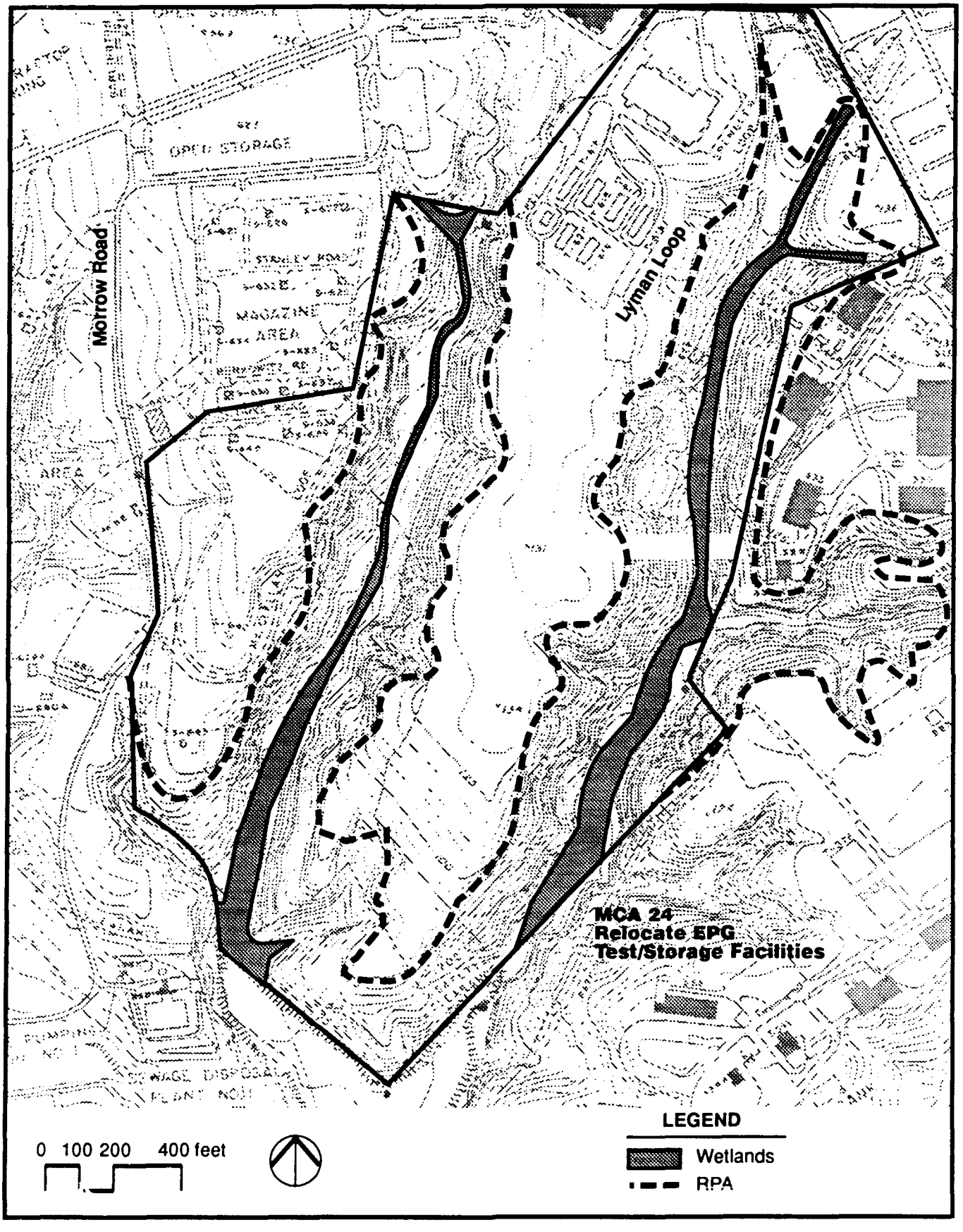


Figure 4-20
MCA 24
Environmental Constraints

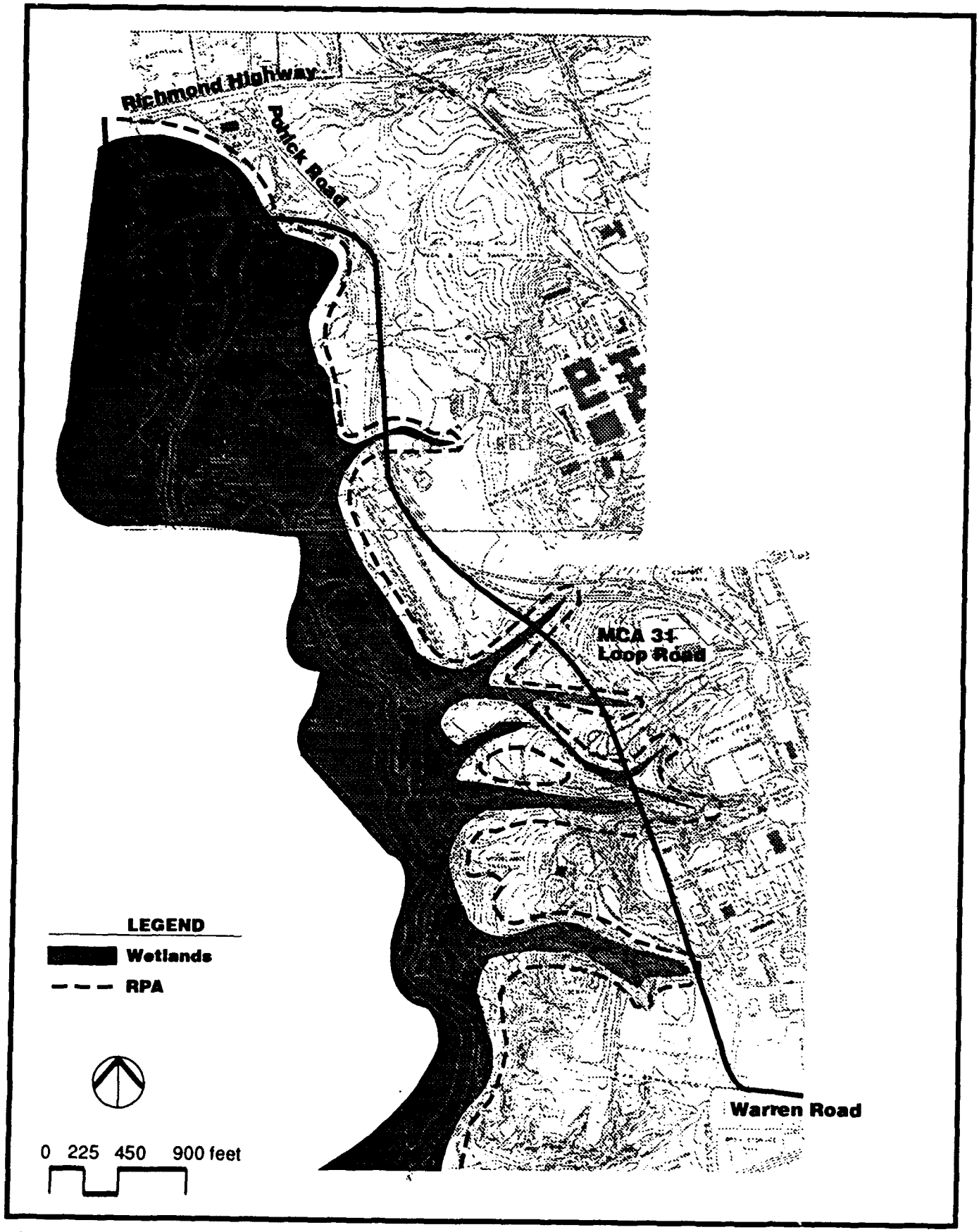


Figure 4-21
MCA 31 Loop Road
Environmental Constraints

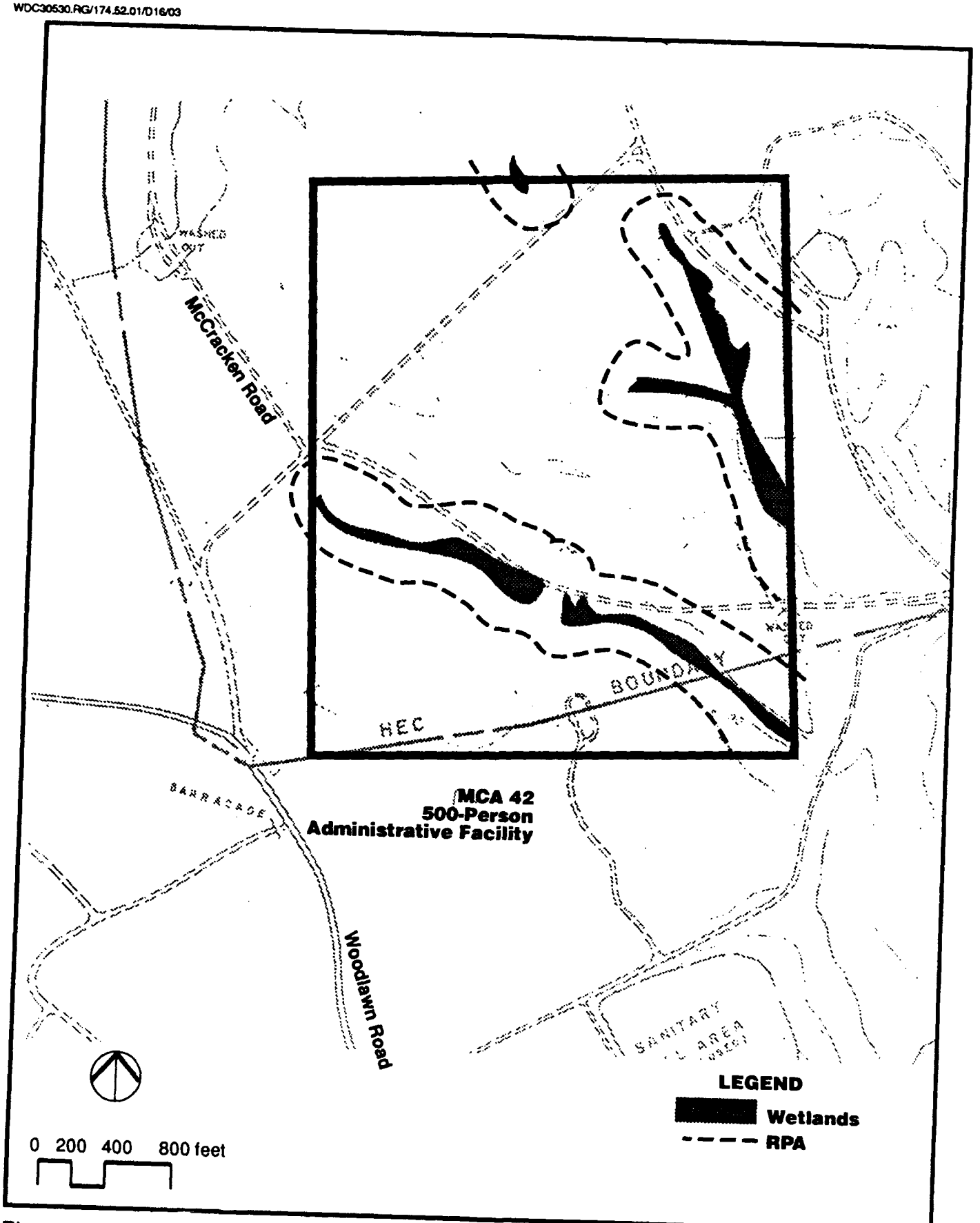


Figure 4-22
MCA 42
Environmental Constraints

existing population of shallow-water fishes. Benthic organisms will be lost, both in the dredged channel and in nearby areas from the settling of suspended particles. However, the loss of benthic invertebrates is temporary and should not have a significant effect on the total benthic population or diversity. Recolonization by benthic invertebrates is rapid, often occurring within two weeks after a disturbance.

The dredging may have a positive effect on the cove by increasing flushing after storm events. This flushing could minimize phytoplankton blooms and encourage the growth of submerged aquatic vegetation by allowing more light penetration. NEPA documentation has been prepared for both NAF 2 and MCA 38. Impacts on aquatic biota are discussed in more detail in *Environmental Assessment: Tompkins Basin Recreational Area, Fort Belvoir, Virginia* (RGH, 1990) and *Environmental Assessment: U.S. Army 1,000-Man Reserve Center, Fort Belvoir, Virginia* (RGH, 1990).

NAF 5 also has the potential to affect aquatic biota. However, the integrated post management plan discussed in Section 4.2.2.1.4 will help minimize these effects.

4.2.2.2.4 Threatened and Endangered Species. All but four of the actions proposed as part of the CDP are sited in areas that are either significantly disturbed by training of heavy equipment use, or already contain structures or parking lots. Construction of the proposed facilities in these areas is not expected to have any significant effect upon any rare, threatened, or endangered species. These projects and any other projects found to have threatened or endangered species and which have the potential to affect them will be coordinated appropriately with state and federal agencies. The projects that do have the potential to affect threatened and endangered species are:

- MCA 25--bald eagle
- MCA 38--bald eagle
- NAF 2--bald eagle
- AFH 3--wood turtle

The boat traffic generated at both MCA 38 and NAF 2 has the potential to affect the three pairs of bald eagles nesting in the vicinity of Gunston Cove. One pair is located within the Accotink Bay Wildlife Refuge at Fort Belvoir, a second pair is located at Mason Neck National Wildlife Refuge, and a third pair is located on private property on Hallowing Point between Pohick Bay Regional Park and Mason Neck National Wildlife Refuge.

The reserve center operations will be structured so that training exercises are planned in areas that will cause the least disturbance to the bald eagles during the breeding season. The most critical months for nesting eagles in this area are typically December through February. Sections of Gunston Cove may need to be restricted during the breeding season to minimize disturbing the breeding eagles.

In addition, MCA 25 is sited just outside the buffer requirements for the nesting pair of bald eagles at Fort Belvoir. Traffic to and from the facility during the breeding season should be monitored to ensure that the pair is not affected.

AFH 3, currently sited in area T-15B (Figure 4-8), with additional units planned for the eastern half of T-15A, could affect a small population of wood turtles. Although this species is currently classified as rare in Virginia, the 1989 Virginia Endangered Species Conference recommended that this species be upgraded to endangered because of its extremely restricted range in Virginia. The Virginia General Assembly is expected to take action on the recommendation during the next session. In addition to the wood turtles, the large area of wetlands on the site contains habitat for several rare, threatened, and endangered plant species. These plants, however, are not readily identifiable until late May to early June and were not located in the March 1990 surveys. Additional surveys may be necessary before construction in these areas to determine if any rare, threatened, or endangered species exist on the site.

4.2.2.3 Socioeconomic Conditions

Because only preliminary information is available about the facilities planned as part of the CDP, broad assumptions were used to evaluate potentially significant impacts. More detailed evaluations will be provided in the Master Plan and accompanying NEPA documentation, which are currently under revision.

4.2.2.3.1 Land Use. The projects proposed as part of the CDP are consistent with the land use plan developed for Fort Belvoir.

4.2.2.3.2 Population. Approximately 5,300 additional military and civilian personnel could be relocated to Fort Belvoir by the year 2010 as part of the CDP as shown in Table 4-11. This includes the relocation of an estimated 4,500 military personnel and dependents (assuming 1,500 couples, each with 1 child) now living elsewhere in the Washington, D.C., metropolitan area to Fort Belvoir after construction of AFH 3.

Because most of the personnel affected by these actions are currently in the area, the population increase is expected to have a negligible effect at the regional level. However this increase could have a significant effect on the local area. Many of the CDP projects are planned to minimize the effects of the potential population increase.

MCAs 15, 21, 38, AFH 3, and NAF 2 will result in increased numbers of people in the immediate vicinity of Fort Belvoir on the weekends; however, the increase is not expected to be significant because the total number of personnel is still significantly less than the number of personnel on base during the week.

4.2.2.3.3 Housing. It is expected that there will be some impacts to housing, over time, as additional personnel are relocated to Fort Belvoir as part of the CDP. However, it is not known at this time how many personnel involved will relocate into the area because of these actions. More detailed analysis will be completed when NEPA documentation is prepared for each of these projects. The CDP includes several whole-house renewals (AFHs 1, 2, and 4 through 14), as well as construction of 1,500 new family housing units (AFH 3).

Table 4-11
POTENTIAL POPULATION INCREASE AT FORT BELVOIR BY THE YEAR 2010 AS A RESULT OF DEVELOPMENT

	Activity	Population Increase
MCA 13	HQ, U.S. Air Force	200
MCA 15	Virginia Army National Guard Armory/HQ*	25
MCA 21	D.C. Army National Guard Academy*	25
MCA 38	Reserve Center/OMA (80th Div)	25
MCA 42	Administrative Facility, HEC	500
AFH 3	1,500 Family Housing Units	4,500
TOTAL		**5,275**

*For planning purposes, assumes facilities are roughly the same scale as MCA 38. *It should also be noted that the full-time weekday population for MCAs 15, 21, and 38 is approximately 5 percent of the expected weekend training population.*

4.2.2.3.4 Employment. It is expected that there will be some impacts to employment, over time, as additional personnel are relocated to Fort Belvoir as part of MCAs 15, 17, 21, 28, 38, 42, and AFH 3. Temporary employment associated with all construction activities will increase for the duration of the individual projects. However, it is not known at this time how many personnel involved will relocate into the area because of these actions. More detailed analysis will be completed when NEPA documentation is prepared for each of these projects.

4.2.2.3.5 Income. It is expected that there will be some impacts to income, over time, as additional personnel are relocated to Fort Belvoir as part of the CDP. However, it is not known at this time how many personnel involved will relocate into the area because of these actions. More detailed analysis will be completed when NEPA documentation is prepared for each of these projects.

4.2.2.3.6 Community and Army Facilities. MCAs 13, 15, 21, AFH 3, and 38 involve personnel that are already located within the region. Therefore, minimal impacts to community facilities are expected from the relocation of these activities to Fort Belvoir. MCA 42 may have a slight effect on community facilities, if the transfer of personnel from outside the region is necessary. The construction of AFH 3 will allow an estimated 4,500 military personnel and their dependents, now living elsewhere in the Washington, D.C., metropolitan area, to move to Fort Belvoir. The impacts on community facilities may be offset by the upgrade and addition of comparable Army

facilities. Many of the facilities identified in Table 4-12 would provide services that would otherwise be provided by the community, and for that reason, impacts should minimal.

Table 4-12
NEW COMMUNITY AND ARMY FACILITIES PLANNED AS PART OF THE CONCEPT DEVELOPMENT PLAN

	Action	Facility Type
MCA 1	Child Development and Religious Education Centers	Army
MCA 6	Veterinary Clinic	Army/Community Comparable
MCA 8	Telephone Switch Upgrade	Army
MCA 11	Main Sewer Line Upgrade, Postwide	Army
MCA 12	North Post Fire Station	Army/Community Comparable
MCA 14	Physical Fitness Center	Army
MCA 22	Electrical Upgrade, Postwide, Phase I	Army
MCA 23	Lateral Sewer Line Repair	Army
MCA 29	Main Post Library	Army/Community Comparable
MCA 32	Community Center/Welcome Center	Army/Community Comparable
MCA 37	Military Police Station	Army/Community Comparable
NAF 1	Youth Center	Army/Community Comparable
NAF 2	Tompkins Basin Armed Forces Recreation Area	Army/Community Comparable
NAF 3	Horse Stables	Army/Community Comparable
NAF 4	Benyuard Pool Addition	Army/Community Comparable
NAF 5	Golf Course	Army/Community Comparable
NAF 6	Corporate Fitness Center	Army/Community Comparable
NAF 7	Child Development Center	Army/Community Comparable
NAF 8	Temporary Lodging Facility	Army
AAFES 1	Fast Food (Burger King™)	Army/Community Comparable
AAFES 2	Fast Food (Chicken)	Army/Community Comparable
AAFES 3	Car Care Facility	Army/Community Comparable

Upgrades to some facilities and most utilities are planned in the CDP to mitigate the effects of proposed CDP activities. The facilities that are proposed to mitigate impacts to both Army facilities and comparable community facilities are listed in Table 4-10. The addition of these facilities, as well as the facilities described in Section 4.2.1.3.7, to Fort Belvoir should lessen the impacts to parallel facilities found in the surrounding localities.

Solid waste impacts were discussed for BRAC actions in Section 4.2.1.3.6. The site development and renovation work proposed under the CDP will generate a large volume of debris (i.e., stumps, grubbing and clearing debris, and demolition and construction waste). Fort Belvoir's plan is to dispose of this debris at the existing Poe Road landfill. As capacity diminishes Fort Belvoir intends to secure a permit from the Virginia Department of Waste Management to expand that landfill for the purpose of disposing of debris waste.

Fort Belvoir intends to dispose of the municipal solid waste (MSW) generated by the CDP projects off the post. The installation will enter into an agreement with Fairfax County to dispose of their MSW at the County's incinerator at Lorton. Because many of the projects are not funded and specific details are uncertain, it is difficult to estimate the volumes of trash to be generated by CDP projects. Some of the projects, such as NAF 2, will have seasonally different uses while some projects will simply be new facilities for existing personnel. Section 4.2.2.3.2 indicates an estimated increase of about 5,300 people by the year 2010 as a result of CDP projects. On the basis of existing waste-generation rates, this population increase would increase the MSW an additional 10.1 tons per day. Therefore, in the year 2010, Fort Belvoir could generate about 59.1 tons per day without recycling or about 44.3 tons per day assuming a recycling rate of 25 percent.

4.2.2.3.7 Traffic and Transportation. The base network and major improvement assumptions are described in detail in the *Regional Traffic Impact Analysis*. In the year 2000, there will be an additional 1,500 units of on-post family housing at Fort Belvoir and MCA 42 will have been constructed.

The forecast 2000 composition of the traffic flow in the Fort Belvoir area is shown in Figure 4-23. The traffic flows at a cordon drawn around Fort Belvoir are divided by facility into either background traffic or traffic generated by BRAC or CDP development. This figure presents an accurate portrayal of the relative magnitude of the impact of BRAC- and CDP-generated traffic on overall traffic flows by facility. Impacts that cause conditions to degrade to undesirable levels of service have been identified along with appropriate mitigation measures.

The additional Fort Belvoir CDP improvements to public highways may not require significant widening of roadway links in the year 2000. It is assumed that, if Richmond Highway is widened to eight lanes for baseline conditions (or to a six-lane expressway), the resultant baseline roadway configuration will meet the Fort Belvoir (i.e, BRAC and Concept Development Plan) development traffic needs in terms of the number of lanes

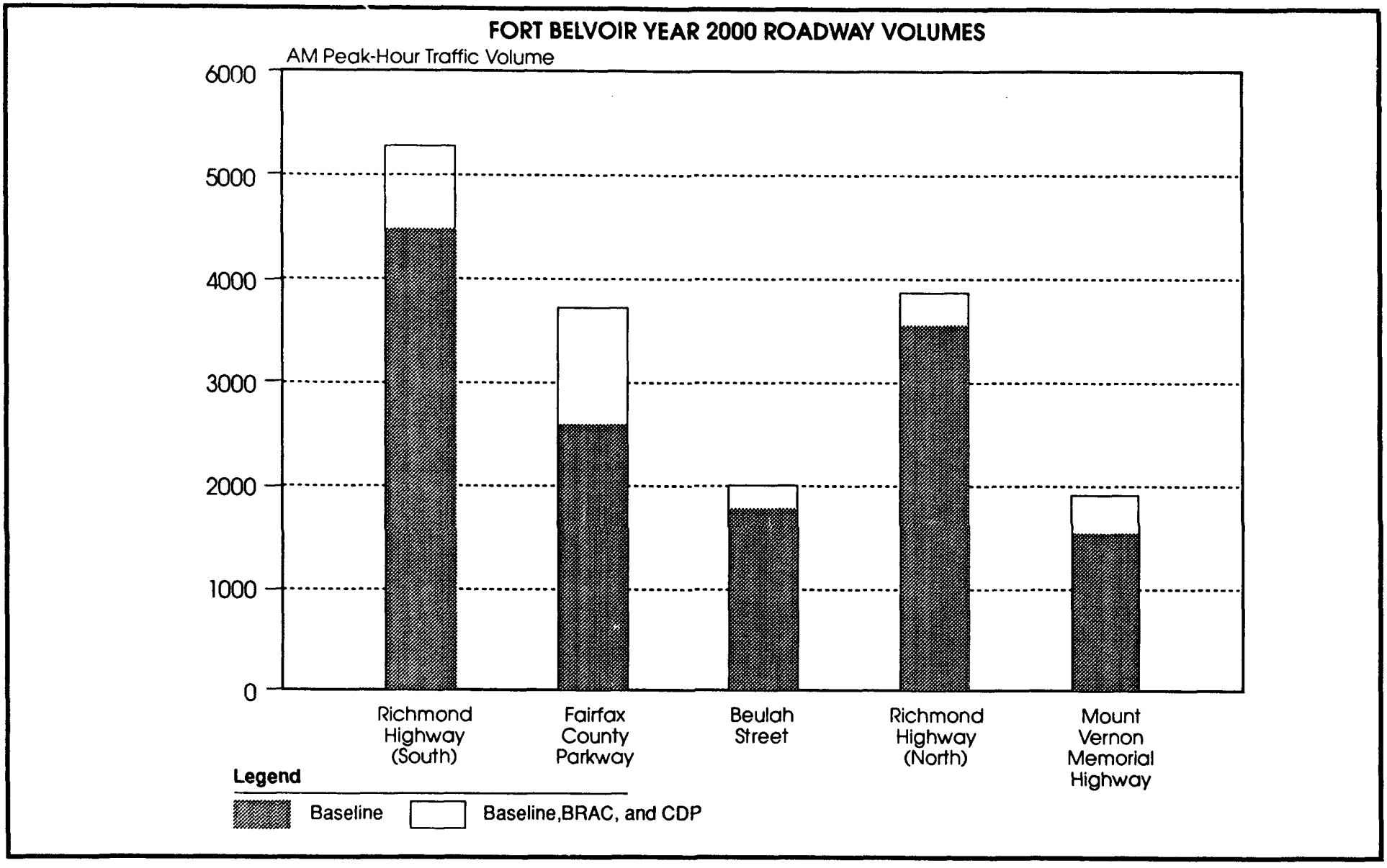


Figure 4-23
Impact of BRAC and CDP Traffic

within the traffic corridor. Improvements to the public highways (e.g., Fairfax County Parkway and Richmond Highway) are the responsibility of VDOT. Funding of practicable improvements to these roads will be negotiated among VDOT, Fairfax County, and the Department of the Army. These improvements include the addition of left- and right-turn lanes, traffic signals or signal upgrades, and additional lanes or participation in new highway projects. These projects will support traffic generated by Army development.

As shown in Figure 4-24, additional intersection improvements may be needed to compensate for the traffic generated by the implementation of the Fort Belvoir Concept Development Plan, including BRAC. These improvements include adding turning lanes to the following intersections:

- Richmond Highway and Woodlawn Road (1995 BRAC requirement)
- Richmond Highway and Mount Vernon Memorial Highway
- Fairfax County Parkway and BRAC Roads (1995 BRAC requirement)

An additional two lanes are required on BRAC Roads, North, between Woodlawn Road and Gunston Road. If MCA 42 is built, southbound Telegraph Road may require a second left turn lane (Figure 4-24) at Beulah Street and Telegraph Road.

4.2.2.4 Cultural Resources

4.2.2.4.1 Historic Resources. The Operations Building 201 (MCA 7a), Belvoir Village (AFH 7), Gerber Village (AFH 8), and Jadwin Loop (AFH 10) are located in Fort Belvoir's Historic District, and MCAs 29 and 34 are adjacent to it (see Table 4-13). Gerber Village, Belvoir Village, and Jadwin Loop each contain one building that has a significant interior, as well as exterior. The Lewis Heights renovation is in the Woodlawn Plantation Historic District. Development in historic districts must be architecturally compatible with existing buildings. Construction activities near, as well as on, historic buildings should be monitored and controlled to avoid affecting the stability of those buildings.

From the information available, it appears that MCAs 12, 14, 37, and 38 will involve the demolition of potentially historic buildings. Standing-structure surveys are required to assess the historic value of these buildings. Not here enough information is yet available about these proposed projects to determine the extent of the effects, if any. Subsequent NEPA documentation for these individual projects will need to address this issue specifically.

4.2.2.4.2 Archeological Resources. Development activities at Fort Belvoir will inevitably affect some of the many identified prehistoric and historic archeological sites, either directly through earth movement or, in most cases, indirectly through increased use of areas in the vicinity of these sites.

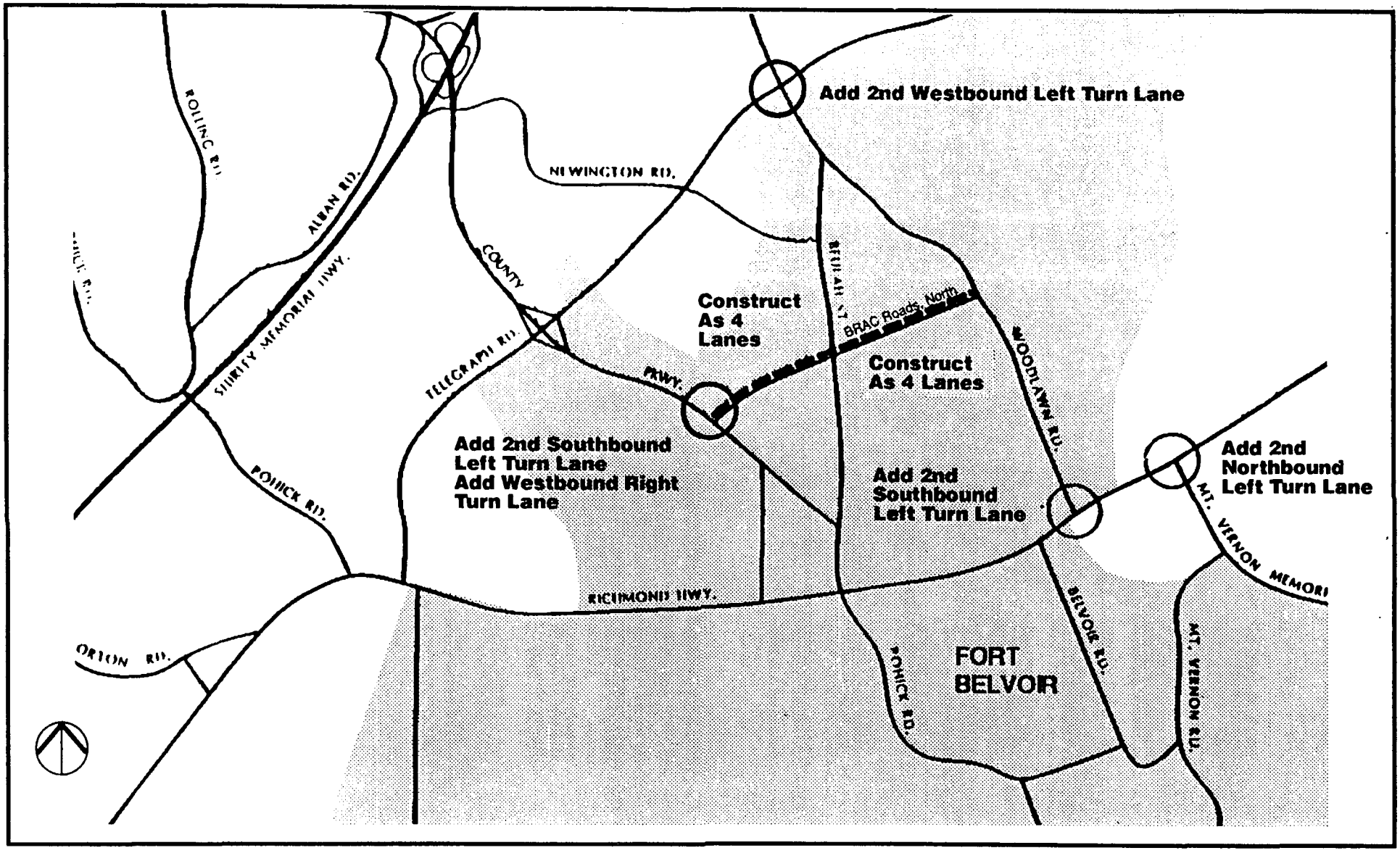


Figure 4-24
Year 2000 Improvements to Mitigate
Fort Belvoir Concept Development Plan
and BRAC Impacts

ENVIRONMENTAL IMPACT STATEMENT

Comprehensive Base Realignment/Closure
and Fort Belvoir Development
Arlington and Fairfax Counties and the City of Alexandria, VA

Table 4-13
EFFECTS OF PROPOSED CDP PROJECTS AT FORT BELVOIR ON CULTURAL RESOURCES

Proposed Action	Status of Cultural Resources on Project Site
MILITARY CONSTRUCTION ACTIVITY (MCA)	
1. Child Development and Religious Education Centers	Under construction
2. Electronics Supply and Maintenance Facility	Severely disturbed; portions need Phase I survey
3. D.C. Army National Guard Armory	Under construction
4. D.C. Army National Guard Aircraft Parking Apron	Severely disturbed, no survey needed
5. Convert Buildings 206 and 208 to Classrooms	Under construction
6. Veterinary Clinic	Portions severely disturbed; rest need Phase I survey
7. Operations Building Renovation, Engineer School Backfill	Building 201 is in Historic District; all exterior renovations will be coordinated with the SHPO and the Advisory Council on Historic Preservation; design will be compatible with other buildings in the district.
8. Telephone Switch Upgrade, Post-wide	No impacts (existing utilities, no siting involved)
9. Fixed-Wing Runway Extension	Severely disturbed, no survey needed
10. Old Guard Horse Stables	Two sites identified in project area, Phase II survey ongoing
11. Main Sewer Line Upgrade, Post-wide	No impacts (existing utility rights-of-way, disturbed)
12. North Post Fire Station	Severely disturbed, no survey needed; involves demolition of potentially historic building (built in 1941)
13. Headquarters, Air Force Intelligence Agency	Survey complete, no archeological sites found
14. Physical Fitness Center	Severely disturbed, no survey needed; involves demolition of two potentially historic buildings (built in 1940)
15. Virginia Army National Guard Armory/Headquarters (29th Light Infantry Division)	Partially surveyed, no sites found; rest needs Phase I
16. Gunston Road Extension	Portion severely disturbed; rest needs Phase I survey
17. D.C. Army National Guard Hangar Addition	Severely disturbed, no survey needed
18. Seabee Operational Storage Facility	Severely disturbed, no survey needed
19. Renovate Heat Plant	No survey needed, no effects on historic properties
20. Renovate Building 361 for ADP	No survey needed, no effects on historic properties
21. D.C. Army National Guard Academy	Entire project site needs Phase I survey
22. Electrical Upgrade, Post-wide, Phase I	None (existing utilities, no siting involved)
23. Lateral Sewer Line Repair, Post-wide	No impacts (existing utility rights-of-way, disturbed)
24. Relocate EPG Test/Storage Facilities	Entire project site needs Phase I survey
25. Ammunition Storage Facility	Surveyed, no archeological sites found; there is a site adjacent to project area
26. Information Systems Facility	Portion needs Phase I survey; rest severely disturbed
27. CIDC Field Operations Building	Survey completed; no archeological sites found
28. D.C. Army National Guard Cantonment	Entire project site needs Phase I survey

Table 4-13
EFFECTS OF PROPOSED CDP PROJECTS AT FORT BELVOIR ON CULTURAL RESOURCES

Proposed Action	Status of Cultural Resources on Project Site
MILITARY CONSTRUCTION ACTIVITY (MCA) (cont'd.)	
29. Main Post Library	Portion needs Phase I survey; rest severely disturbed; adjacent to Historic District
30. *(there is no MCA 30)*	*(n/a)*
31. Loop Road	Most of the site severely disturbed; rest needs survey
32. Community Center/Welcome Center	Entire project needs Phase I survey
33. Facility Engineer Maintenance Shop	Needs standing-structure survey; portion of site needs Phase I survey; rest severely disturbed, no survey needed
34. Warehouses	Severely disturbed, no survey needed; adjacent to Historic District
35. Tactical Energy Systems Lab	Severely disturbed, no survey needed; no effects on historic structures
36. Conforming Storage Building (DRMO)	Survey completed; no archeological sites found
37. Military Police Station	Severely disturbed, no survey needed; could affect potentially historic building (built in 1940)
38a. Reserve Center/OMA (80th Div): North Post site	Phase I survey needed on most of site (moderately disturbed): involves demolition of many potentially historic buildings; standing-structure survey required
38b. Reserve Center/OMA (80th Div): South Post (Marina)	Survey completed; no archeological sites found
39. Consolidated Maintenance Shop (DOL)	Severely disturbed, no survey needed; could affect potentially historic buildings
40. Electro-Optics Laboratory	Severely disturbed, no survey needed; no effect on historic structures
41. Fatigue Test Facility	Severely disturbed, no survey needed; no effect on historic structures
42. Potential 500-person Administrative Facility, HEC	Phase I survey needed
NON-APPROPRIATED FUNDS (NAF)	
1. Youth Center	Needs Phase I and standing-structure surveys
2. Tompkins Basin Armed Forces Recreation Area	One site is eligible for the National Register of Historic Places; Phase II study ongoing for a second site
3. Horse Stables	See MCA 10 (same site)
4. Benyuard Pool Addition	Severely disturbed, no survey needed; no impact to historic structures
5. Golf Course	One site needs Phase II study; rest needs Phase I survey
6. Corporate Fitness Center	Needs Phase I survey; classified as moderately disturbed
7. Child Development Center	Part needs Phase I survey; rest severely disturbed
8. Temporary Lodging Facility	Severely disturbed, no survey needed

Table 4-13
EFFECTS OF PROPOSED CDP PROJECTS AT FORT BELVOIR ON CULTURAL RESOURCES

Proposed Action	Status of Cultural Resources on Project Site
ARMY AND AIR FORCE EXCHANGE SERVICES (AAFES)	
1. Fast Food Facility (Burger King™)	Severely disturbed, no survey needed
2. Fast Food Facility (Chicken)	Severely disturbed, no survey needed
3. Car Care Facility	Severely disturbed, no survey needed
ARMY FAMILY HOUSING (AFH)	
1. Lewis Heights Renewal, Phase 1	No archeological sites; in the Woodlawn Historic District
2. Lewis Heights Renewal, Phase 2	No archeological sites; in the Woodlawn Historic District
3. 1,500 NCO Housing Units (New)	Needs Phase I survey
4. Dogue Creek Village Whole-House Renewal	No survey needed, no impacts
5. George Washington Village Whole-House Renewal	No survey needed, no impacts
6. River Village Whole-House Renewal	No survey needed, no impacts
7. Belvoir Village Whole-House Renewal	In Historic District; exterior renovations must be architecturally compatible
8. Gerber Village Whole-House Renewal	In Historic District; exterior renovations must be architecturally compatible
9. Visiting Officers' Quarters Renovation	No survey needed, no impacts
10. Jadwin Loop Whole-House Renewal	In Historic District; exterior renovations must be architecturally compatible
11. Colyer Village Whole-House Renewal	No survey needed, no impacts
12. Rossell Loop Whole-House Renewal	No survey needed, no impacts
13. Woodlawn Village Whole-House Renewal	No survey needed, no impacts
14. Fairfax Village Whole-House Renewal	No survey needed, no impacts

Notes:
See figures in Chapter 3 for locations of project sites.
All proposed actions affecting existing buildings require a standing-structure survey.
Phase I - Investigative Survey
Phase II - Evaluative Survey

WDCR510/001.51

Site locations for the facilities proposed by the Concept Development Plan are now in the planning phase and may change somewhat because of design criteria, environmental constraints, or other factors during the detailed design phase. Because exact building "footprints" are for the most part not yet available, direct impacts to historic and archeological sites can only be analyzed in general. Coordination with the SHPO and the Advisory Council on Historic Preservation will be completed, along with the required NEPA documentation, when these projects are funded and final siting is under way.

Table 4-13 lists all MCA, AFH, and other proposed facilities/activities and identifies any potentially significant resource sites known to be on or near these actions. Disturbance to recorded sites that have been determined to be ineligible for listing on the National Register of Historic Places and do not require further study is considered to be an insignificant impact; these sites are not included.

Direct impacts to potentially significant resource sites will be avoided by detailed site design wherever possible. Direct impacts will be mitigated, if they are unavoidable, by means of evaluative study (Phase II) and removal of artifacts (Phase III), in accordance with accepted scientific procedures, under the supervision of a qualified professional. Because of the potential for indirect impacts to nearby sites whenever a new facility is built, evaluative surveys should be a priority for resource sites contiguous to, but not directly affected by, the proposed facilities as well.

NAF 2 has the greatest potential to affect significant cultural resources. A category 1 resource site, determined to be eligible for the National Register of Historic Places, has been located within the site boundaries of NAF 2. In addition, a Phase II evaluative study is in progress for a second site.

Several other actions, MCA 10, NAF 3, and NAF 5, may directly affect sites that require additional evaluative study to determine their eligibility. Indirect impacts to nearby sites requiring further study are possible at MCA 24, MCA 25, and AFH 3.

While the majority of the areas to be affected have been surveyed for the presence of archeological and historic resources or are so severely disturbed that no survey is necessary, a number of the proposed CDP projects still require a Phase I survey on all or part of the proposed project sites: MCAs 2, 6, 15, 16, 21, 24, 26, 28, 29, 31, 32, 33, 38, and 42; and NAFs 1, 6, and 7 (personal communication, Fort Belvoir DEH Staff, September 8, 1990). Phase I investigative surveys, and Phase II evaluative studies, of any significant resources identified in locations likely to be affected, will be completed before these areas are disturbed.

4.2.2.4.3 Visual Resources. Development in currently undeveloped areas of Fort Belvoir, many of which feature rolling, tree-covered slopes, will reduce the overall aesthetic value of the areas, although it will provide an aesthetically pleasing environment to the future occupants of office buildings and houses. The *Installation Design Guide, Fort Belvoir, Virginia* will be followed as site designs are developed. Buildings should be designed to fit the existing topography, minimize effects of grading, and retain mature

trees in order to minimize aesthetic impacts. NAF 2 will alter the view from the Potomac River, from that of a tree-lined bluff to that of a recreational development.

4.2.2.5 Hazardous Materials

Five of the projects proposed by the Concept Development Plan would store or generate hazardous materials as part of their mission. Table 4-14 lists these activities. All hazardous materials on post will be handled and stored in compliance with all applicable county, state, and federal regulations. Any asbestos removal required as part of demolition or renovation will be conducted in accordance with all federal, state, and local regulations.

Table 4-14
CONCEPT DEVELOPMENT PLAN ACTIONS THAT MAY RESULT IN THE GENERATION OR STORING OF HAZARDOUS MATERIALS/SUBSTANCES

Project	Generates or Stores
NAF 5	May store herbicides and pesticides
MCA 35	May generate and store unspecified materials from research, development, and testing activities
MCA 25	Ammunition will be stored in accordance with TM 9-1300 and AR 190-11 as well as all other applicable non-military regulations
MCA 24	Hazardous materials will be handled according to all applicable regulations
MCA 36	Hazardous materials will be handled according to all applicable regulations
MCA 39	Will handle, store, and dispose of all solvents, oils, lubricants, and degreasers in accordance with applicable regulations.
MCA 40	May generate and store unspecified materials as a result of research, development, and testing activities

Projects such as the proposed golf course (NAF 5) and other large-area projects that typically require the maintenance of fairways, greens, and lawns, have the potential to affect groundwater if pesticides, fungicides, and herbicides are applied incorrectly. To reduce the potential for accidents, staff will be trained and certified in the application of these chemicals and will adhere to the installation's integrated pest management program.

4.3 FORT MYER

4.3.1 PHYSICAL/CHEMICAL RESOURCES

4.3.1.1 Physiography and Topography

The construction of the new DOL facilities, commissary, shoppette, and PX expansion at either the preferred alternative or Alternative 2 for each of the projects at Fort Myer will have minimal effects on existing topography. Buildings will be sited to minimize grading activities and designed to complement the topography at each of the proposed sites.

4.3.1.2 Geology and Groundwater

Construction of the four new facilities required by the realignment will not have any significant effect on the existing geology at either the preferred alternative or Alternative 2 for any of the projects because no extensive subsurface activities are planned.

4.3.1.3 Soils

No detailed soil survey is available for Fort Myer; therefore, subsurface investigations will be conducted at the proposed sites to determine the suitability of the soils for development. This will be done under design engineering contracts issued for the new facilities. Of the soil associations that make up Fort Myer, only the Fairfax-Beltsville-Glenelg association may require special design considerations, such as dampproofing the foundation, because of the presence of expansive clays in the Beltsville series soils (USDA, 1955).

As outlined in the *Virginia Erosion and Sediment Control Handbook* (2nd edition, 1980), all applicable soil erosion measures will be taken to minimize downstream erosion.

4.3.1.4 Surface Water

No impacts to surface water are expected because none of the sites or their alternatives is currently located near surface water at Fort Myer. Soil and erosion control measures will use BMPs to minimize effects of surface water runoff at construction sites. No floodplains will be affected.

4.3.1.5 Climate and Air Quality

The realignment will have no effect on the regional climate, nor will the climate affect the activities being realigned. Local ambient air quality may be temporarily affected by a slight increase in total suspended particulates during clearing and grading operations. Dust control measures, however, will be taken to minimize the effect of the grading on the local air quality. The additional traffic on post after the transfer of DOL personnel, and on the weekends after the new commissary, shoppette, and PX expansion are

constructed, should have a minimal, although permanent, effect on local ambient air quality. This effect will occur independently from this project. An additional permanent degradation in local air quality will occur because of the increase in the equipment stored at Fort Myer.

4.3.2 BIOLOGICAL RESOURCES

4.3.2.1 Terrestrial Biota

4.3.2.1.1 Vegetation. Because of the limited amount of native vegetation located at each of the proposed alternative sites, impacts to vegetation will be minimal.

4.3.2.1.2 Wildlife. Because of the developed nature of Fort Myer and its lack of undisturbed habitat, the construction of the four new facilities will have minimal effects on the urban wildlife currently using the sites.

4.3.2.2 Wetlands

No wetlands were located within the boundaries of any of the four sites during the field survey conducted as part of the BATES. The only wetlands located on Fort Myer were along the unnamed stream on the western boundary of the post.

4.3.2.3 Aquatic Biota

Because of the absence of any surface water or wetlands near the proposed sites there will be no impact to aquatic resources from the construction of the DOL facilities, the commissary, shoppette, or the PX expansion.

4.3.2.4 Threatened and Endangered Species

No rare, threatened, or endangered species occur at Fort Myer. No impacts to these species are expected.

4.3.3 SOCIOECONOMIC CONDITIONS

Realignment of personnel to Fort Myer from Cameron Station is expected to involve approximately 15 military and 177 civilian personnel. Again, although some of the effects discussed below appear to be significant at the local level, the effects are not significant at the regional level (see Section 4.1.3).

4.3.3.1 Land Use

The proposed facilities are consistent with existing land use patterns both on Fort Myer and in the surrounding neighborhoods, and, therefore, no significant impacts are expected. Figure 4-25 shows the new land-use pattern at Fort Myer after the construction of the DOL facility, commissary, shoppette, and PX expansion. Some of the existing open

WDC30530.RG/174.52.01/023/06

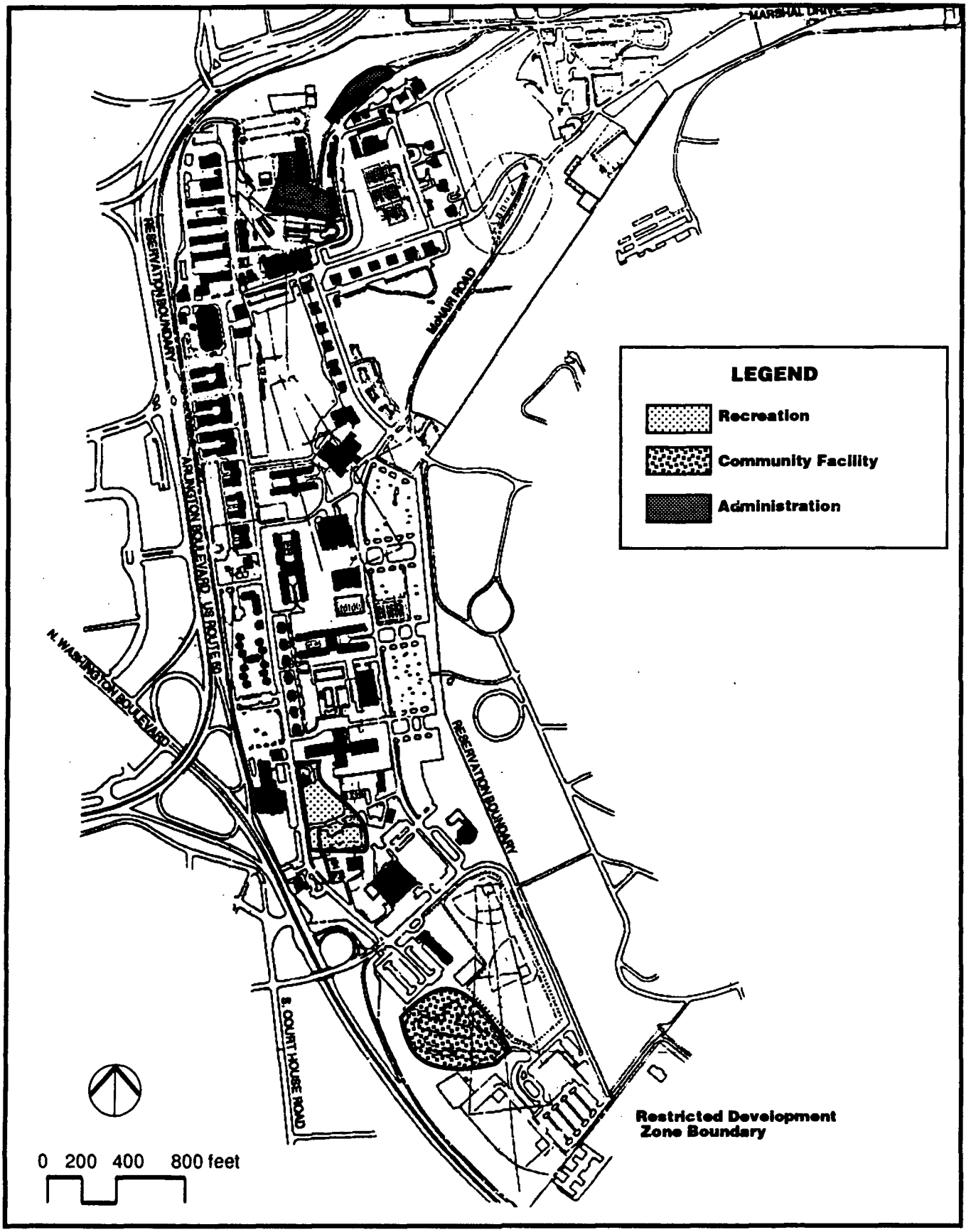


Figure 4-25
Fort Myer
Proposed Land Use

space at Fort Myer will be lost when the PX expansion, shoppette, and commissary are constructed at the preferred alternative. These facilities would be constructed in lieu of a three-story administration building that was previously planned for the site.

4.3.3.2 Population

Approximately 15 military and 177 civilian personnel will be realigned to Fort Myer from Cameron Station. No personnel will be realigned from outside of the region.

4.3.3.3 Housing

Transfer of personnel from Cameron Station is not expected to result in a change of residence for the affected personnel, but rather a change of commuting pattern.

4.3.3.4 Employment

The primary and secondary effects of realignment to Fort Myer are estimated to be a 272-person-year increase in regional employment and a more than $6.3-million increase in regional income. The number of people holding second jobs is expected to increase by the equivalent of 8 full-time jobs, and the number of working dependents is expected to increase by 118 person-years (IWR, 1990).

4.3.3.5 Income

Total wages and salaries at Fort Myer are expected to increase by $0.3 million for military personnel and $4.5 million for civilian personnel. Second job income is expected to increase by $1.7 million (IWR, 1990).

4.3.3.6 Construction and One-Time Expenditures

Construction and one-time expenditures associated with BRAC actions at Fort Myer will total approximately $15.1 million.

4.3.3.7 Community and Army Facilities

The addition of approximately 192 personnel to Fort Myer should have a minimal effect on the existing water supply. The existing system is currently sized to support 12,000 personnel. The increase in population at Fort Myer resulting from the realignment, to approximately 5,350, is well within the existing capacity of the water supply.

The wastewater system is also currently sized to handle the proposed population increase. Current maximum system flows can service 9,300 personnel. The projected post-realignment population of 5,350 falls well within the existing system capacity.

Although additional feeders may be installed to provide gas service to the new facilities, the existing natural gas distribution system is adequate to handle the proposed increase in facilities at Fort Myer.

Virginia Power plans to upgrade electric service to Fort Myer with the installation of a new substation near the post. In addition, the *1987 Analytical/Utilities Report for Fort Myer* (U.S. Army, MDW) indicates that two additional 13.8-kilowatt feeders would be required to supply power to all of the master plan actions being considered at that time. These upgrades should also have sufficient capacity to adequately power the realignment activities. Because Virginia Power provides electric service to Cameron Station, the relocation of Cameron Station personnel and facilities to Fort Myer will not increase their service requirements.

As most of the personnel being transferred from Cameron Station to Fort Myer live within the region, no effects to the schools, churches, shopping centers, and recreation facilities serving Fort Myer are expected.

The two steam plants on post will be able to provide sufficient heat for the proposed facilities on the basis of existing capacities; therefore, no significant upgrading of the heating system is expected to be necessary because of personnel and facility realignments to Fort Myer.

The construction of the new commissary, shoppette, and PX expansion will also lessen the effect of the closure of the Cameron facility by providing additional facilities for military personnel. Other facilities available at Fort Myer, listed in Section 3.3.3.7, are not expected to be significantly affected by this action.

4.3.3.8 Traffic and Transportation

Adequate parking will be provided at each of the development sites. There will be increased truck traffic and increased commissary tractor-trailer traffic in proximity to family housing on Fort Myer and military funeral and ceremonial processions. Coordination with Arlington County and Metrobus officials will provide improved access.

4.3.4 CULTURAL RESOURCES

4.3.4.1 Historic Resources

Pursuant to Section 106 of the National Historic Preservation Act, 36 CFR 800, and a Programmatic Agreement with the Advisory Council on Historic Preservation and the National Conference of State Historic Preservation Officers, the Army will consult with the Virginia SHPO and the Arlington County Archeologist. The Army will also execute an MOA stipulating the actions that will be carried out to avoid or mitigate adverse effects of the construction of the new BRAC facilities at Fort Myer on archeologic and historic resources. In order to comply with the MOA, the Army will complete the actions detailed below.

- Review the history of Fort Myer from its inception as part of the Arlington Estate to the present day on the basis of Army, SHPO, county archeologist, National Archive, and Library of Congress and their files

- Consider the history of Fort Myer in the context of military activities in Washington, D.C., southern Maryland, and northern Virginia

- Provide a summary of this history, with emphasis on:

  - The role of Fort Myer in the conduct of World War II
  - The role of Fort Myer in the conduct of the Korean conflict
  - The role of Fort Myer in the conduct of the Vietnam War
  - The role of Fort Myer in other activities of the U.S. Army in the Washington, D.C., area since 1866

- Consider the functions of key buildings and structures at Fort Myer in carrying out the post's various roles during the course of history

- Determine which of these structures appear to have such notable historical significance that they should be considered for long-term preservation

4.3.4.2 Archeological Resources

Fort Myer is located on high ground above the Potomac River, and thus is an area of high potential for prehistoric and early historic archeological sites. However, past grading, building construction, and other activities may have destroyed such sites. The Army will address potential archeological resources at Fort Myer as follows:

- Review currently available predictive models for the region and, on the basis of these models, outline general areas where prehistoric and early historic sites might be expected at Fort Myer

- Study deeds, censuses, tax rolls, historical maps, and other documentary sources relating to the property to determine historical land use before 1941, and from these data predict where archeological sites might be found

- Review available data from the Army, Virginia SHPO, and county archeologist, and others on Fort Myer's soils, as-built plans, and descriptions of grading and construction work, as well as other information pertinent to the modification of the land surface during and after 1941. Information will also be collected by interviewing former Fort Myer employees, known to either the Army or the county archeologist, to identify areas where pre-1941 land surfaces are and are not likely to be preserved under fill

- Identify locations where it is predicted that archeological sites may be preserved under fill, locations where it is predicted that such preservation is unlikely, and identify where subsurface testing is thought to be needed to test these predictions

- Consult with the Virginia SHPO, county archeologist, and other parties regarding the need for and design of subsurface sampling programs

4.3.4.3 Visual Resources

Design of the DOL facility will minimize visual impacts from Arlington National Cemetery by vegetative screening, and potentially by siting the building into the hillside, which will also maximize the site area available for parking.

4.3.5 HAZARDOUS MATERIALS

The two buildings scheduled to be demolished to make room for the shoppette and PX expansion will be screened for asbestos before demolition begins. If the structures are contaminated, the asbestos will be removed and disposed of in accordance with all local, state, and federal regulations. In addition, the perchloroethylene contamination at Building 448 will be remediated in accordance with all local, state, and federal regulations. The contaminated soils will be disposed of in accordance with EPA guidelines. All remedial action will be completed before construction begins.

The new facilities required for DOL will generate solvents, fuels, oils, lubricants, and degreasers, which will be handled, stored, and disposed of in accordance with applicable regulations. The new shoppette, commissary, and PX expansion are not expected to generate or use hazardous materials. No impacts are expected.

4.3.6 CONCLUSIONS

Table 4-15 provides a summary of the effects expected from each of the BRAC projects at each of the proposed sites. A more detailed discussion of the effects is provided below.

4.3.6.1 PX Expansion, Shoppette, and Commissary. Construction of these three facilities at the preferred alternative will provide a centralized shopping area located away from the main portion of the base. This will minimize the amount of traffic driving on the base because the site is located adjacent to the main gate.

Construction of the new facilities at Alternative 2 would not only separate the shopping areas, but would also result in limited parking because of the size of the sites. In addition, construction of a new commissary at Alternative 2 would require the demolition of the existing structure, eliminating the commissary from Fort Myer during construction. Patrons currently using the commissary at Fort Myer would need to drive to either Fort McNair, Walter Reed Army Medical Center, or Fort Belvoir.

4.3.6.2 Logistics Complex. The preferred alternative at Fort Myer would place the DOL activities close to their primary service area (Fort Myer, Fort McNair, and the Pentagon). Location of these activities to Alternative 2, Fort Belvoir DOL, would put these facilities farther away from their primary service area.

Table 4-15
COMPARISON OF EFFECTS OF PROPOSED BRAC ALTERNATIVES AT FORT MYER

	Commissary, Preferred Alternative	**Commissary, Alternative 2**
Physiography & Topography	Final site design will minimize cut & fill.	Final site design will minimize cut & fill.
Geology & Groundwater	No impact.	No impact.
Soils	Subsurface investigations needed.	Subsurface investigations needed.
Surface Water	Will increase stormwater runoff. This will be mitigated by a stormwater management plan.	No impact.
Climate & Air Quality	No impact.	No impact.
Vegetation	No impact.	No impact.
Wildlife	No impact.	No impact.
Game Species	No impact.	No impact.
Wetlands	No impact.	No impact.
Aquatic Biota	No impact.	No impact.
Threatened & Endangered Species	No impact.	No impact.
Land Use	Will change land use from open space to community facilities.	Will change land use from open space to community facilities.
Population	Will increase population at Fort Myer by approximately 28.	Will increase population at Fort Myer by approximately 28.
Housing	No impact.	No impact.
Employment	Will increase employment at Fort Myer by approximately 28.	Will increase employment at Fort Myer by approximately 28.
Income	No impact.	No impact.
Community & Army Facilities	Will increase demand on some facilities; will increase generation of solid waste somewhat, will participate in recycling program. Construction at this site, along with the PX and shoppette, will create a centralized shopping area on Fort Myer.	Will increase demand on some facilities; will increase generation of solid waste somewhat, will participate in recycling program. Construction at this site would result in the temporary loss of commissary facilities at Fort Myer.
Traffic & Transportation	Additional parking areas needed, onpost road upgrades may be required.	Additional parking areas needed, but size of site restricts area available, onpost road upgrades may be required.
Cultural Resources	Phase I survey needed.	Phase I survey needed.
Hazardous Materials	Minimal amounts of hazardous materials will be generated and disposed of according to regulations.	Minimal amounts of hazardous materials will be generated and disposed of according to regulations.

Table 4-15
COMPARISON OF EFFECTS OF PROPOSED BRAC ALTERNATIVES AT FORT MYER

	Shoppette, Preferred Alternative	**Shoppette, Alternative 2**
Physiography & Topography	Final site design will minimize cut & fill.	Final site design will minimize cut & fill.
Geology & Groundwater	No impact.	No impact.
Soils	Subsurface investigations needed.	Subsurface investigations needed.
Surface Water	No impact.	No impact.
Climate & Air Quality	No impact.	No impact.
Vegetation	No impact.	No impact.
Wildlife	No impact.	No impact.
Game Species	No impact.	No impact.
Wetlands	No impact.	No impact.
Aquatic Biota	No impact.	No impact.
Threatened & Endangered Species	No impact.	No impact.
Land Use	Will change land use from open space to community facilities.	Will change land use from open space to community facilities.
Population	Will increase population at Fort Myer slightly.	Will increase population at Fort Myer slightly.
Housing	No impact.	No impact.
Employment	Will increase employment at Fort Myer slightly.	Will increase employment at Fort Myer slightly.
Income	No impact.	No impact.
Community & Army Facilities	Will increase demand on some facilities; will increase generation of solid waste somewhat, will participate in recycling program. Construction at this site, along with the commissary and PX will create a centralized shopping area on Fort Myer.	Will increase demand on some facilities; will increase generation of solid waste somewhat, will participate in recycling program. Construction on this site would create two separate shopping areas on Fort Myer.
Traffic & Transportation	Additional parking areas needed, onpost road upgrades may be required.	Additional parking areas needed, but size of site restricts area available, onpost road upgrades may be required.
Cultural Resources	Phase I survey needed.	Phase I survey needed.
Hazardous Materials	Asbestos surveys will be completed for buildings scheduled to be demolished.	No impact.

Table 4-15
COMPARISON OF EFFECTS OF PROPOSED BRAC ALTERNATIVES AT FORT MYER

	Post Exchange, Preferred Alternative	**Post Exchange, Alternative 2**
Physiography & Topography	Final site design will minimize cut & fill.	Final site design will minimize cut & fill.
Geology & Groundwater	No impact.	No impact.
Soils	Subsurface investigations needed.	Subsurface investigations needed.
Surface Water	No impact.	No impact.
Climate & Air Quality	No impact.	No impact.
Vegetation	No impact.	No impact.
Wildlife	No impact.	No impact.
Game Species	No impact.	No impact.
Wetlands	No impact.	No impact.
Aquatic Biota	No impact.	No impact.
Threatened & Endangered Species	No impact.	No impact.
Land Use	Will change land use from open space to community facilities.	Will change land use from open space to community facilities.
Population	Will increase population at Fort Myer slightly.	Will increase population at Fort Myer slightly.
Housing	No impact.	No impact.
Employment	Will increase employment at Fort Myer slightly.	Will increase employment at Fort Myer slightly.
Income	No impact.	No impact.
Community & Army Facilities	Will increase demand on some facilities; will increase generation of solid waste somewhat, will participate in recycling program. Construction at this site, along with the commissary and shoppette, will create a centralized shopping area on Fort Myer.	Will increase demand on some facilities; will increase generation of solid waste somewhat, will participate in recycling program. Construction on this site would create two separate shopping areas on Fort Myer.
Traffic & Transportation	Additional parking areas needed, onpost road upgrades may be required.	Additional parking areas needed, but size of site restricts area available, onpost road upgrades may be required.
Cultural Resources	Phase I survey needed.	Phase I survey needed.
Hazardous Materials	No impact.	No impact.

Table 4-15
COMPARISON OF EFFECTS OF PROPOSED BRAC ALTERNATIVES AT FORT MYER

	Logistics Complex, Preferred Alternative	Logistics Complex, Alternative 2*
Physiography & Topography	Final site design will minimize cut & fill.	No impact.
Geology & Groundwater	No impact.	No impact.
Soils	Subsurface investigations needed.	No impact.
Surface Water	Will increase stormwater runoff. This will be mitigated by a stormwater management plan.	No impact.
Climate & Air Quality	No impact.	No impact.
Vegetation	No impact.	No impact.
Wildlife	No impact.	No impact.
Game Species	No impact.	No impact.
Wetlands	No impact.	No impact.
Aquatic Biota	No impact.	No impact.
Threatened & Endangered Species	No impact.	No impact.
Land Use	Compatible with existing land use.	No impact.
Population	Will increase population at Fort Myer by approximately 161.	No impact.
Housing	No impact.	No impact.
Employment	Will increase employment at Fort Myer by 161 employees.	No impact.
Income	No impact.	No impact.
Community & Army Facilities	Will increase demand on some facilities; will increase generati of solid waste somewhat, will participate in recycling program.	No impact.
Traffic & Transportation	Additional parking areas needed, onpost road upgrades may be required.	No impact.
Cultural Resources	Phase I survey needed.	No impact.
Hazardous Materials	Multiple solvents, fuels, battery acids, greases, and oils will be handled in accordance with all applicable county, state, and federal regulations.	No impact.

*This alternative places the Logistics Complex at Fort Belvoir and, therefore, no impacts at Fort Myer would be expected.

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4.4 FORT MCNAIR

The proposed action at Fort McNair only involves the transfer of two persons and a limited amount of office equipment from Cameron Station to the Information Management Office at Fort McNair. This action does not require the modification of any existing facilities, so there will be no physical, chemical, or biological impacts to the facility.

No socioeconomic or traffic impacts are expected because the number of personnel involved is low. No additional buildings or cost structure changes are required to house the two individuals being realigned to Fort McNair from Cameron Station, and as a result, no Section 106 requirement of the NHPA exists for this action.

4.5 ENGINEER PROVING GROUNDS

The development scenario for the public-private development initiative proposed at EPG is for a mixture of uses: approximately 3.1 million square feet of Army office space, 4.9 million square feet of private office space, more than 1.6 million square feet of other non-residential space including hotel, retail, and related uses, and approximately 5,600 high-density residential units with a projected population of up to 15,000 persons at buildout in the year 2010. Development of the proposed office, hotel, and residential space at EPG is phased over a 15- to 20-year period. This phasing is expected to facilitate market absorption of housing units and office space. A separate EIS is being prepared for EPG development.

4.5.1 PHYSICAL/CHEMICAL RESOURCES

4.5.1.1 Physiography and Topography

Most of the slopes on EPG exceeding 15 percent are located in the environmental quality corridor (EQC). Moderate slopes in the western portion of the site would be graded to some extent. Most of the commercial development is planned for the southwest area, which is relatively flat.

4.5.1.2 Geology and Groundwater

No effects on either geology or groundwater are expected.

4.5.1.3 Soils

No significant impact is expected. Soil erosion would be controlled by a erosion and sediment control plan approved by Fairfax County.

4.5.1.4 Surface Water

Minimal impacts to streams are expected because the EQC would be protected. The 100-year floodplain surrounding Accotink Creek and its tributaries is included in the EQC.

4.5.1.5 Climate and Air Quality

No effects on climate are expected at EPG because of development. There may be an increase in air pollution to the region from increased vehicular traffic. Temporary effects because of construction activities are likely, and would be controlled as required. There are no point sources of air pollution currently planned for this development.

4.5.2 BIOLOGICAL RESOURCES

4.5.2.1 Terrestrial Biota

4.5.2.1.1 Vegetation. Approximately 225 acres of existing vegetative cover would be preserved in the EQC. In areas to be cleared for development, the Fairfax County tree preservation ordinance would be adhered to.

4.5.2.1.2 Wildlife. There would be a loss of habitat as a result of clearing for construction; however, the EQC would allow wildlife to relocate to other suitable habitat.

4.5.2.1.3 Wetlands. Because Fairfax County is including the EQC designation in their definition of RPA for the Chesapeake Bay Preservation Act, no impacts are expected.

4.5.3 SOCIOECONOMIC CONDITIONS

4.5.3.1 Land Use

The residential development area is being sited adjacent to existing housing areas in the northern part of EPG. Entrances to the property in this area are expected to serve residential rather than office traffic, reducing the impact on adjoining neighborhoods. The commercial development in the western part of EPG would be separated from existing residential areas to the west by Rolling Road and the Fairfax County Parkway alignment. Office and commercial development is planned for the southern portions of the site.

According to the draft EIS for the EPG development project, only about half of the total 820 acres at EPG are available for buildings and parking; 25 percent of the site would be needed for roads and stormwater management. About 27 percent of the total acreage is potentially restricted because of probable wetlands (hydric soils) and the designation of the Accotink stream valley as an EQC. Visual resources would be affected by loss of wooded areas, but enhanced by removal of deteriorating structures now on the site. The commercial areas would mostly be visible from Shirley Highway and other commercial areas in the vicinity.

4.5.3.2 Population

The projected residential population at buildout of EPG in the year 2010 is between 14,000 and 15,000. Since the development would be phased in over a 20-year period, the population increase should be absorbed with minimal effects.

4.5.3.3 Housing

The project may increase the availability of affordable housing in the area, depending upon the final zoning and design.

4.5.3.4 Employment

The EPG development would have a positive effect on the local job market.

4.5.3.5 Income

The EPG development should have a positive effect on local income.

4.5.3.6 Community and Army Facilities

Current county police, fire, and rescue facilities in the vicinity of EPG are considered adequate for the initial phases of this development, but may not be for future phases. A new Fairfax County Fire and Rescue station about 5 miles from EPG (to be built sometime before the year 2000) is under consideration. The high-density residential development at EPG could contribute approximately 1,377 school-age children over the 15- to 20-year building period, allowing adequate time for Fairfax County to plan new schools if necessary. No impacts to Army facilities are expected.

4.5.3.7 Traffic and Transportation

4.5.3.7.1 Year 1995 EPG Stage I Development. Stage I development at EPG would include approximately 700,000 square feet of Army-related development, 465,000 square feet of commercial office space, and 525 dwelling units. Within the EPG study area, development would have some impact on intersection operation. Assuming that the development at EPG would have three access points (i.e., two on the Fairfax County Parkway and one on Backlick Road), site-generated traffic would be distributed fairly evenly among these access points. At each of these points, exclusive turn lanes may be needed.

4.5.3.7.2 Year 2000 EPG Stage II Development. The post network and major improvement assumptions are described in detail in the *Regional Traffic Impact Analysis*. In the year 2000 the EPG development is assumed to include approximately four million gross square feet of commercial development and 2,275 dwelling units. The year 2000 development for the EPG site has an incremental effect on transportation system needs in the EPG study area. The development at this stage would have approximately 1.5 million square feet of Army-related development, 2 million square feet of commercial

office space, 550,000 square feet of retail space and 2,275 dwelling units. This development scenario requires (as one option) the 10-lane I-95 cross section (as called for in the *Fairfax County Comprehensive Plan*) and the Richmond Highway expressway with eight through lanes between Armistead Road and Telegraph Road. The effects of the site-generated traffic at the EPG are detailed in the EPG EIS.

Modifications and improvements may be required for the intersections listed below. Because these are public highways, improvements would be determined and funded jointly by VDOT, Fairfax County, the Department of the Army, and private developers.

Ramp Modification

- I-95 and Fairfax County Parkway
- Fairfax County Parkway and Franconia/Springfield spur
- Fairfax County Parkway and Rolling Road
- Franconia/Springfield spur and Backlick Road

Intersection Improvements

- Fairfax County Parkway and Old Hooes Road
- Fairfax County Parkway and Fullerton Road
- Backlick Road and BRAC Roads

The proximity of Fullerton Road and I-95 would likely necessitate grade separation of Fullerton Road at the Fairfax County Parkway.

4.5.3.7.3 Year 2010 EPG Stage III Development. A development concept, which included a total of 3.1 million square feet of Army office space, approximately 5 million square feet of commercial office space, 1.7 million square feet of other non-residential space, and up to 5,600 dwelling units, was used for EPG.

The ongoing EPG planning process and EIS would result in a refined plan that would be used to develop a transportation plan meeting the needs of the development plan and acceptable to Fairfax County.

The EPG would add significant volumes of traffic to the highway system in the immediate vicinity of the EPG. Fortunately, the new roadways currently under construction or programmed would absorb much of the newly generated traffic. These new or improved roadways include:

- The Fairfax County Parkway
- The Franconia-Springfield Parkway
- The widening of Backlick Road and Rolling Road
- The extension of the I-95 HOV lanes with a southbound flyover from I-95 to Backlick Road

Further transportation improvements would be needed to handle EPG traffic at full buildout. The studies thus far completed, using the assumed EPG development levels, indicate that the transportation system would likely require the following improvements:

- Widen the Fairfax County Parkway from a 4- to 6-lane cross section from the Franconia-Springfield Parkway Interchange to I-95
- Provide an 8-lane section of the Fairfax County Parkway between Rolling Road and Sydenstricker Road, as recommended in the regional transportation plan, which is part of the *Fairfax County Comprehensive Plan*
- Upgrade the Fairfax County Parkway interchange serving EPG to a full cloverleaf
- Improve the at-grade intersection of the Fairfax County Parkway serving the northwest portion of EPG
- Consider a new access point from the Fairfax County Parkway west of Backlick Road, providing right-turn access and egress
- Provide access from the Franconia-Springfield Parkway at its proposed interchange with Neuman Street
- Upgrade Neuman Street
- Upgrade the existing entrance to EPG from Backlick Road
- Provide direct access to EPG from the southbound I-95 flyover ramp
- Provide a new access point to EPG from Backlick Road south of the existing access point
- Improve other local intersections

The transportation-related effects of the EPG development are also being addressed in a separate EIS.

4.5.4 Cultural Resources. Several cultural resource surveys have been conducted at EPG, but only one artifact has been found. Because of this, EPG has been determined to be free of archaeological resources (Polk, 1990).

A standing-structure survey would be required before any of the structures at EPG can be demolished.

4.5.5 Hazardous Materials. The EPG would be cleared of all hazardous materials before development. No sources of hazardous materials are planned for the development of EPG.

4.6 CUMULATIVE IMPACTS

The proposed actions, whether they are associated with BRAC or the CDP, have the potential to affect their immediate surroundings as well as the region. Each action has been reviewed according to certain criteria. This section presents an assessment of the cumulative effect of each separate proposed action on each resource category considered. The effects of the development of EPG and implementation of the CDP are based on the level of information available at the time this EIS was prepared. The effects of the construction of a 500-person administration building at HEC are discussed in general terms in the CDP analysis.

Table 4-16 details the compliance of each of the BRAC actions with major federal environmental laws as known at this time. Table 4-17 details the permits that may be required for each of the BRAC actions based on information available at the time of this report.

4.6.1 PHYSICAL/CHEMICAL RESOURCES

Several of the categories in this section are general or they represent physical features that are so large that even on a cumulative basis, when regional development trends are considered, there are no significant effects. There do not appear to be any cumulative effects for physiography and topography, geology and groundwater, soils, or climate.

4.6.1.1 Surface Water

Affects on surface water should be minimal. Final site plans for all projects will incorporate BMPs to minimize erosion and downstream sedimentation. In addition, Fort Belvoir will comply with the Chesapeake Bay Preservation Act.

4.6.1.2 Air Quality

The increased number of vehicles in the area may have a slight detrimental effect on the ambient air quality in the area immediately surrounding Fort Belvoir and EPG.

4.6.2 BIOLOGICAL RESOURCES

4.6.2.1 Terrestrial Biota

Fort Belvoir is committed to maintaining at least 35 percent of its acreage as natural areas, refuges, and protected wetlands. This commitment will be formalized by identifying these areas as either refuges or environmentally sensitive areas in the next update of the installation's Master Plan. The total acreage and location of the areas will be determined by the *Fort Belvoir Natural Resources Management Plan.*

Table 4-16
COMPLIANCE WITH ENVIRONMENTAL QUALITY PROTECTION STATUTES
AND OTHER ENVIRONMENTAL REVIEW REQUIREMENTS FOR BASE CLOSURE ACTIONS, MDW

Installation	Proposed Action	Historic Preservation Acts	Clean Air Act	Clean Water Act & CBPA	Endangered Species Act	Harbors, Scenic River Acts	Watershed Protection Act	E.O. 11988, Floodplain Management	E.O. 11990, Wetlands Protection	RCRA
Cameron Station	Closure	1	Complies	Complies	1	Complies	Complies	Complies	Complies	Complies
Fort Belvoir	Headquarters Complex	1	Complies	Complies	1	Complies	Complies	Complies	Complies	Complies
	Industrial Park	1	Complies	Complies	1	Complies	Complies	Complies	Complies	Complies
	BRAC Roads	1	Complies	2	1 and 2	2	2	2	2	2
	Commissary Warehouse Addition	1	Complies	Complies	1	Complies	Complies	Complies	Complies	Complies
	Post Exchange	1	Complies	Complies	1	Complies	Complies	Complies	Complies	Complies
	Commissary	1	Complies	Complies	1	Complies	Complies	Complies	Complies	Complies
	Administration Facility	1	Complies	Complies	1	Complies	Complies	Complies	Complies	Complies
	Material Research Facility	1	Complies	Complies	1	Complies	Complies	Complies	Complies	Complies
	Exchange Branch	1	Complies	Complies	1	Complies	Complies	Complies	Complies	Complies
	Modify Buildings 1466 & 1445	1	Complies	Complies	1	Complies	Complies	Complies	Complies	Complies
	ISC Personnel Realignment	Complies	Complies	Complies	Complies	Complies	Complies	Complies	Complies	Complies
Fort Myer	DOL	1	Complies	Complies	1	Complies	Complies	Complies	Complies	Complies
	Commissary	1	Complies	Complies	1	Complies	Complies	Complies	Complies	Complies
	PX Expansion	1	Complies	Complies	1	Complies	Complies	Complies	Complies	Complies
	Shoppette	1	Complies	Complies	1	Complies	Complies	Complies	Complies	Complies
Fort McNair	MDW Information Management Personnel Realignment	Complies	Complies	Complies	Complies	Complies	Complies	Complies	Complies	Complies

Legend:
E.O. = Executive Order
CBPA = Chesapeake Bay Preservation Act
1 = Coordination in process, full compliance anticipated
2 = Detailed studies in process, full compliance anticipated

Table 4-17
PERMITS POTENTIALLY REQUIRED FOR CONSTRUCTION OF BASE CLOSURE PROJECTS, MDW

Installation	Proposed Action	General Building	Trade Permits	Subaqueous Bed Permit	Section 401 Water Quality Certificate	Section 404 Wetlands Permit
Cameron Station	Closure	No	No	No	No	No
Fort Belvoir	Headquarters Complex	Yes	Yes	No	No	No
	Industrial Park	Yes	Yes	No	No	No
	BRAC Roads	Yes	Yes	Yes	Yes	Yes
	Commissary Warehouse Addition	Yes	Yes	No	No	No
	Post Exchange	Yes	Yes	No	No	No
	Commissary	Yes	Yes	No	No	No
	Administration Facility	Yes	Yes	No	No	No
	Material Research Facility	Yes	Yes	No	No	No
	Exchange Branch	Yes	Yes	No	No	No
	Modify Buildings 1466 & 1445	Yes	Yes	No	No	No
	ISC Personnel Realignment	No	No	No	No	No
Fort Myer	DOL	Yes	Yes	No	No	No
	Commissary	Yes	Yes	No	No	No
	PX Expansion	Yes	Yes	No	No	No
	Shoppette	Yes	Yes	No	No	No
For McNair	MDW Information Management Personnel Realignment	No	No	No	No	No

Note:
Permit requirements are based upon information available at the time of this EIS. Jurisdictional wetland delineations will be performed for each of the sites; upon their completion, permit requirements for individual projects may change.

4.6.2.1.1 Genetic Corridor. The genetic corridor will be significantly affected if BRAC 1, MCA 13, and NAF 5 are all constructed. These projects together could result in the corridor being completely severed in this area. This would result in the isolation of wildlife populations at Huntley Meadows Park and Mason Neck National Wildlife Refuge. It may also result in the loss from the North Post area of some area-dependent species currently found on Fort Belvoir (barred owl, ovenbird, pileated woodpecker, great horned owl, and Cooper's hawk) because of habitat fragmentation. BRAC 1 has been designed to provide 250- to 300-foot buffer on the northern boundary of the site to protect the corridor. When final NEPA documentation is prepared for NAF 5 and MCA 13, final siting of one or both of these facilities may change to prevent the corridor from being severed.

Construction of AFH 3 and MCAs 15, 21, and 28 could cause additional constrictions (Figure 4-26), limiting movements of wildlife south of Backlick Road and Beulah Street. The Fort Belvoir Master Plan, currently being revised, will provide a management plan to protect the genetic corridor on the post from future development, including these projects, as part of the *Fort Belvoir Natural Resources Management Plan*. The plan will ensure that, at minimum, a contiguous corridor of native vegetation at least 250 feet wide is maintained between Huntley Meadows Park and Mason Neck National Wildlife Refuge.

Oversized box culverts or bridges will be designed into all road projects at all drainages determined to be either jurisdictional wetlands or critical wildlife habitat. These structures will be monitored monthly for two years using track census methods to evaluate their effectiveness and assist with future design efforts.

4.6.2.1.2 Vegetation. NAF 5 and AFH 3 could require the largest amounts of clearing for construction. The clearing of these sites will reduce the amount of tree cover on Fort Belvoir. However, each project will be required to comply with the Fairfax County tree ordinance. The remaining projects at the post should not have significant effects on vegetative cover. The development of approximately 600 acres at EPG will significantly reduce the amount of open space remaining in the study area. To the extent possible, native vegetation will be preserved in the developed areas. This could provide a vegetative screen and tree islands for parking lots, as well as habitat for wildlife.

4.6.2.1.3 Wildlife. In general no significant effects on wildlife are expected. However, if the genetic corridor is severed or constricted to the point that it no longer functions to facilitate animal movements, subpopulations of species could become isolated at Fort Belvoir, Huntley Meadows Park, and Mason Neck National Wildlife Refuge. This could lead to inbreeding, overexploitation of resources, and a loss of species diversity in some areas of the post. The revised Master Plan will contain a strategy to protect the corridor and minimize impacts.

The same situation would also occur at EPG; however, the maintenance of the EQC should allow species to relocate to other suitable habitat.

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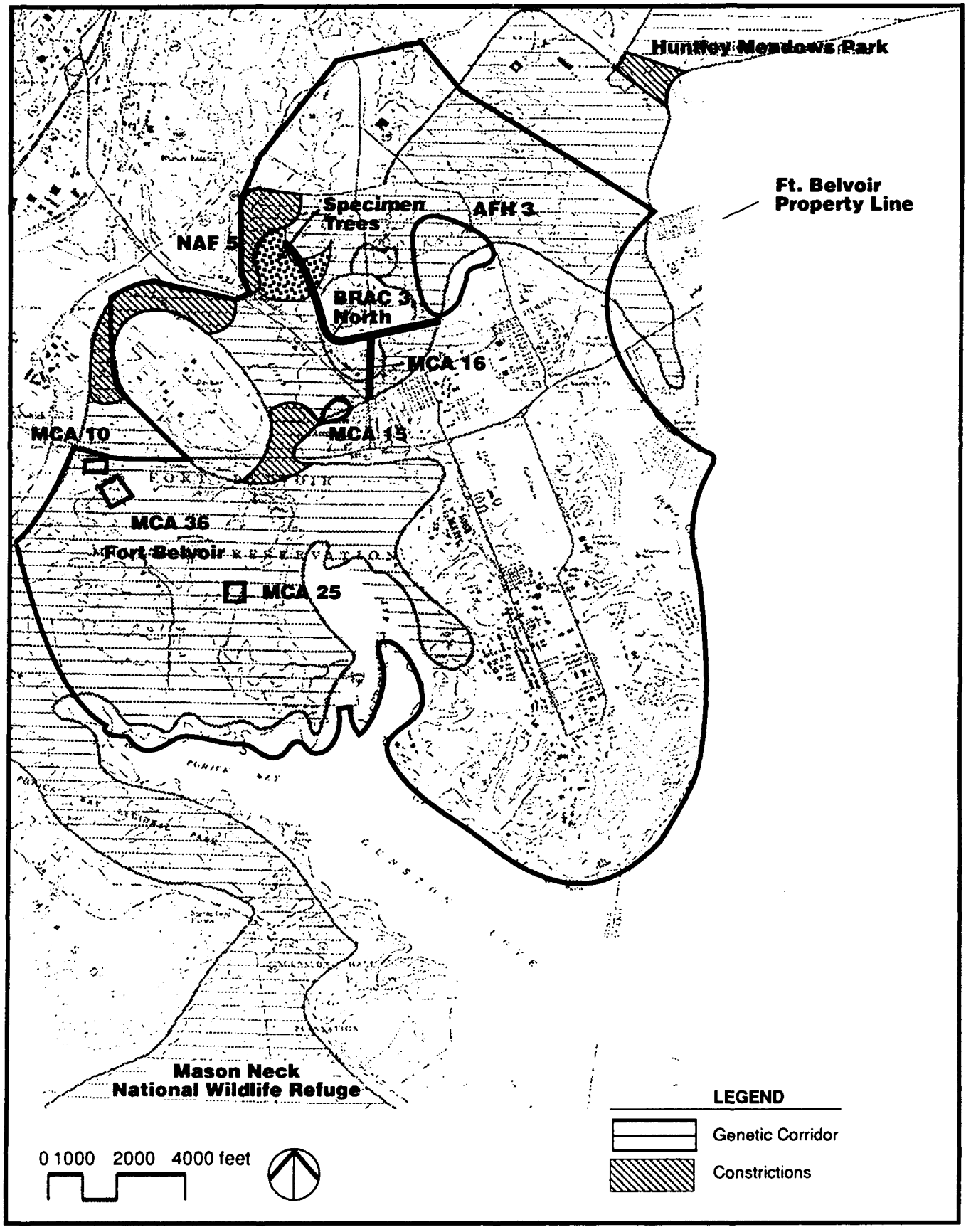


Figure 4-26
Cumulative Impacts to the Genetic Corridor Alignment and Critical Constrictions on Fort Belvoir

4.6.2.2 Wetlands

There will be no significant cumulative effects from the planned actions on wetlands. Wetlands are protected by the Clean Water Act, and jurisdictional wetland delineations will be performed on all sites that could contain wetlands. Permits will be acquired and mitigation completed when required.

The Army has agreed to adhere to state and local water-quality ordinances and regulations implemented to protect the Chesapeake Bay as outlined in Appendix E. Sites will be designed to avoid affecting designated RPA features and buffers, and no significant effects are expected.

4.6.2.3 Aquatic Biota

There will be temporary effects to aquatic biota because of the dredging required for NAF 2 and MCA 38. However these effects are not expected to be significant.

Herbicide and pesticide use at NAF 5 could affect aquatic biota in the streams on the site. The golf course should be designed to minimize runoff of these chemicals into the streams. The EQC will be protected at EPG and no effects are expected.

4.6.2.4 Threatened and Endangered Species

When the details of the CDP projects are known, coordination with federal and state agencies will occur for each project in order to minimize the effects to threatened and endangered species. Site surveys will also be completed as part of this process.

Boating activities generated by both MCA 38 and NAF 2 will be controlled to minimize impacts to the three pairs of federally endangered bald eagles nesting in the area. Fort Belvoir personnel will monitor the activities of the eagles on the post to determine critical roosting and feeding areas. A management plan will be developed that will minimize the effects of boaters on the eagles during critical periods. This plan may include restrictions on boating or other similar activities in Gunston Cove during the breeding season and other critical periods.

BRAC 3 will be designed to minimize impacts to wood turtles found in the surrounding woodlands.

4.6.3 SOCIOECONOMIC CONDITIONS

Overall the effects associated with socioeconomic conditions are expected to be insignificant because a net increase of only 123 military and civilian personnel is expected in the region from BRAC realignments. It is considered extremely unlikely that all of the families being transferred to Fort Belvoir from outside the Washington, D.C., metropolitan area as a result of P.L. 100-526 would relocate in the immediate vicinity of Fort Belvoir. In addition, the population increases resulting from the CDP projects are

associated primarily with weekend use of the base by personnel either already in the region or transient personnel assigned temporarily to the post.

4.6.3.1 Land Use

Land use will be altered at specific sites, but when considered by installation and by region, the effects are insignificant. Many of the changes are simply reallocations of uses from one area to another within the same installation. At Cameron Station and EPG, there will be the conversion from government to private ownership, and the land-use classification will change. There will also be the conversion of some open space to development uses. The intensity of development at EPG will increase greatly. The local governments will determine the new land-use categories through the rezoning process.

4.6.3.2 Population

Effects on population are not significant regionally because most of the actions are simply a transferring of people from one site in the region to another. The actions that involve bringing additional people into the region will also not have a significant effect on population.

4.6.3.3 Housing

The change in demand for housing will not be significant for reasons similar to those stated in the previous section. An increase in on-post housing will reduce the demand for off-post housing. Under the development scenarios presented in this EIS, residential development at both EPG and Cameron Station will increase housing in the region.

4.6.3.4 Employment

There will be a shift in the location of some of the existing employment as well as the creation of new employment opportunities. The increase in new jobs will not be regionally significant.

4.6.3.5 Income

Income trends tend to follow those of employment. Because the cumulative effect on employment is that relatively few new jobs will be created, there will be a corresponding effect on income levels. Income levels should be unaltered for government employees. Some increase in resident income levels would be anticipated from the private development of EPG and Cameron Station.

4.6.3.6 Community and Army Facilities

Some community-related Army facilities will be closed because of some of the proposed actions. These facilities are being replaced with new facilities at Fort Belvoir

and Fort Myer. The proposed actions will require that Fairfax County plan new schools. Most of the other actions involve moving existing facilities from one location to another.

4.6.3.7 Traffic and Transportation

As the Washington, D.C., metropolitan area continues to grow during the next 20 years, there will be a need to improve and enhance the current transportation system in northern Virginia. The VDOT, Fairfax County, City of Alexandria, Metropolitan Washington Council of Governments, and the Washington Metropolitan Area Transit Authority have developed plans to address the anticipated needs. Construction of the Fairfax County Parkway and the Franconia-Springfield Parkway, the extension of the Shirley Highway HOV express lanes, the planned extension of the Metrorail system to Franconia-Springfield, initiation of regional commuter rail service, and the widening of the Capital Beltway are examples of actions geared to improve the region's mobility.

Traffic generated by the planned development at Fort Belvoir, EPG, and Cameron Station will affect area traffic conditions. Determine the number of trips each of these developments will generate, as well as the travel patterns these trips will create, is relatively straightforward. Determining the specific offsite improvements these new developments will require, as well as the additional needs continually being created by other regional development, is more difficult. Many of the offsite improvements, which are identified as being needed to support one or more of the Army developments, would be required within several years even without any Army development. The Army's developments account for merely a part of the total development-related transportation needs in northern Virginia and, in most cases, merely accelerate the need for an improvement that would be required at a later date regardless of Army activity.

A complicating factor in the assessment of needs is that the major north-south access roads in the vicinity of Fort Belvoir (i.e., Richmond Highway, and Telegraph Road) largely serve the same corridor and currently the number of lanes is deficient. Adding capacity on one route results in a shift of traffic within the corridor until levels of congestion are balanced.

Table 4-18 presents a summary of the existing conditions, baseline requirements, and additional improvements needed for roads and intersections affected by the proposed development at Cameron Station, Fort Belvoir, and EPG in the years 1995, 2000, and 2010. Baseline requirements are those improvements to roads and intersection needed to support existing traffic and planned regional growth in the years specified. The additional improvements listed are those upgrades recommended to support the proposed development at Cameron Station, Fort Belvoir, and EPG in the benchmark years. Roads and intersections that require improvements to support planned regional growth, but are not affected by the proposed development, are not included in Table 4-18. The improvements to these roads and intersections would be required regardless of any actions covered by this EIS. These improvements would be the responsibility of local and state highway departments.

Table 4-18
MATRIX OF RECOMMENDED HIGHWAY IMPROVEMENTS

	Current Number of Lanes[2]	Baseline Requirements LOS D				Additional Improvements Needed for Development[1]		
		1990	1995	2000	2010	1995	2000	2010
Roadway Construction								
FCP: (Sydenstricker Road to Rolling Road)			6	6	6			2-EPG
FCP: (Rolling Road to I-95)			4	4	4			2-EPG
FCP: (I-95 to Richmond Hwy)			4	4	4			
BRAC Roads, North: (FCP to Gunston Road)						4-FTB	4-FTB	4-FTB
BRAC Roads, North: (Gunston Road to Woodlawn Road)						2-FTB	4-FTB	4-FTB
Neuman Street: (Upgrade from FSP to EPG Site; Extend within site)							2-EPG	2-EPG
Roadway Widening								
I-95: Mainline lanes (Gordon Boulevard to FCP)	6		6	6	8			0-EPG
Richmond Highway: (Gordon Boulevard to Telegraph Road)	4	6	6	6	6	2-FTB[4]	*-FTB	*-FTB
Richmond Highway: (Telegraph Road to Backlick Road or FCP)	4	6	6	6	6	2-FTB	*-FTB	*-FTB
Intersection Modification								
I-95 and Backlick Road or FCP			X[3]					EPG
I-95 and Backlick Road (slip ramp)								EPG
Richmond Highway and FCP						FTB	FTB	FTB
FCP and FSP								EPG
FCP and Rolling Road (south of EPG)								EPG
FCP and Fullerton Road								EPG
Duke Street and Cameron Station Site Access						CAM	CAM	CAM

Table 4-18
MATRIX OF RECOMMENDED HIGHWAY IMPROVEMENTS

	Current Number of Lanes[2]	Baseline Requirements LOS D				Additional Improvements Needed for Development[1]		
		1990	1995	2000	2010	1995	2000	2010
Intersection Modification (continued)								
Richmond Highway and Woodlawn Road			X			FTB	FTB	FTB
Richmond Highway and Mount Vernon Memorial Highway		X	X				FTB	FTB
Telegraph Road and Beulah Street		X	X	X		FTB	FTB	
FCP and EPG Site Access						EPG		
FCP and Old Hooes Road							EPG	
FCP and Fullerton Road							EPG	
FCP and BRAC Roads, North						FTB	FTB	FTB
Van Dorn Street and S. Pickett Street		X	X			CAM	CAM	CAM

NOTE:
FCP = Fairfax County Parkway, CAM = Cameron Station, EPG = Engineer Proving Grounds, FTB = Fort Belvoir.
* = Indicates that roadway widening recommended for 1995 will not be necessary in 2000 or 2010 if grade separations identified as 2000 and 2010 baseline requirements are constructed.
[1]Improvements which provide LOS D for baseline plus development scenario. Development site identified for each improvement (e.g., FTB). Improvements do not carry over from 1995 to 2000 to 2010; each improvement is listed in each year for which it is necessary.
[2]Shown only for Roadway Widening projects.
[3]An X in a column indicates that some improvements are needed at the location specified in the year specified.
[4]From Armistead Road to Telegraph Road.

4.6.4 CULTURAL RESOURCES

4.6.4.1 Archeological and Historic Resources

The cumulative effects of BRAC and CDP actions on cultural resources is primarily dependent on final siting of the construction projects at Fort Belvoir. The two areas of greatest concern are the category 1 historic site at NAF 2 and the project area for AFH 3, which has not been surveyed for cultural resources. These and several other proposed actions (BRAC 3, MCA 10, AFH 3, NAF 3, and NAF 5) could affect up to 15 potentially significant archeological sites. If possible, disturbance of these resource sites will be avoided. If disturbance is unavoidable, evaluative study and mitigation will be conducted in accordance with all of the applicable regulations and the memorandum of agreement on file between the Army and the SHPO and the Advisory Council on Historic Preservation. Any exterior (or interior, where applicable) alterations to buildings scheduled for renovation in the historic district will be coordinated with the SHPO and the Advisory Council on Historic Preservation to ensure compliance with regulations.

The Army will complete an inventory of resources and any other required actions regarding cultural resources at Cameron Station before construction activities or disposal of land. Development related to BRAC actions at Fort Myer may affect the historic district at that post. At minimum, a Phase I cultural resource survey will be completed for the proposed sites before construction begins.

A Programmatic Agreement among the Army, the National Conference of State Historic Preservation Officers, and the Advisory Council on Historic Preservation (signed on February 5, 1990) describes the process the Army will use to satisfy its obligations under Section 106 of the NHPA, so that NEPA can be completed before the actual completion of the NHPA responsibilities. Section 106 and 110 responsibilities under NHPA will be completed by the Army before initiation of construction activities or disposal of lands.

4.6.4.2 Visual Resources

There will be an impact on visual resources when EPG and Cameron Station are redeveloped as mixed-use developments. The loss of open space at EPG will be noticeable as buildings are constructed. The redevelopment at Cameron Station may have a positive impact as the industrial facilities, which are currently on the property, are replaced with commercial, retail, and residential structures more compatible with adjacent structures in the City of Alexandria. The Army is providing development plans for both EPG and Cameron Station to minimize visual impacts.

Development in currently undeveloped areas of Fort Belvoir, many of which feature rolling, tree-covered slopes, will reduce the overall aesthetic value of those areas, although it will provide an aesthetically pleasing environment to the future occupants of office buildings and housing. The *Installation Design Guide, Fort Belvoir, Virginia* will be followed as site designs are developed. Buildings should be designed to fit the existing

topography, minimize the effects of grading, and retain mature trees in order to minimize aesthetic impacts. NAF 2 will alter the view in from the Potomac River, from that of a tree-lined bluff to that of a recreational development.

4.6.5 Hazardous Materials

Cameron Station and EPG will be evaluated for the presence of hazardous materials, and a statement of condition will be prepared for each installation before its disposal and redevelopment. Any hazardous materials generated at Fort Belvoir will be handled, stored, and disposed of in a manner consistent with applicable federal, state, and local regulations.

WDCR504/030.51

Chapter 5.0
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Chapter 7.0
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Chapter 8.0
GLOSSARY

Agency coordination - Process by which appropriate federal, state, and local agencies are notified of a proposed action and the EIS in order to solicit their comments on the proposed action.

Alternative actions - All alternative scenarios for a proposed action.

Aquatic biota - Organisms that spend a predominant portion of their lives in water, including fish, frogs, salamanders, and aquatic insects.

Aquifer - A permeable rock formation or zone below the earth's surface that bears water.

Archaeological resource - Identified location of man-made artifacts, dated to prehistoric or historic periods, which have the potential to contribute to the knowledge of human history. Both the artifact and the integrity of the site in which it is found contribute to the significance of the resource.

Benthic invertebrates - Those animals lacking a spine that inhabit the bottom of creeks, streams, rivers, ponds, lakes, and oceans.

Bloom conditions - Conditions that promote the concentrated growth of algae in the water, usually high nutrient concentrations resulting from pollution.

Brackish - Water that is saline, but less so than sea water. Salinity typically ranges from 0.03 - 2.2 percent chlorine.

Brackish water tidal wetlands - Wetlands that are found in tidal brackish water. These wetlands are predominantly emergent and are critical nursery areas for anadromous fish (fish that live in the ocean and spawn in fresh water).

Cambrian - The oldest of the periods of the Paleozoic Era; also the system of rock formations and soil layers deposited during that time period (570 to 500 million years ago).

Coastal plain - Any plain that has its margin on the shore of a large body of water, particularly the sea, and generally represents a strip of recently (geologically speaking) emerged sea bottom.

Conglomerate - Rounded or waterworn fragments of rocks or pebbles, cemented together by another mineral substance.

Corrosion prevention - Technology and methodology used to minimize corrosion.

Cultural Resource - All historic structures and archeologic sites.

Endangered species - Any species that is in danger of extinction throughout all or a significant portion of its range, excluding any species of the class Insecta determined by the U.S. Secretary of Interior to constitute a pest whose protection would present an overwhelming and overriding risk to man.

Environmental Impact Statement (EIS) - A public document prepared for the primary purpose of ensuring that NEPA policies and goals are incorporated early into the programs and actions of federal agencies. An EIS is also prepared for private and municipal projects receiving federal funding and when required by other federal laws such as the Clean Water Act. An EIS is required when a proposed action may significantly affect environmental quality, public health or safety, or resources. Resources include, but are not limited to, historic and archaeological resources, parks, wilderness areas, wildlife refuges, threatened and endangered species, wetlands, prime or unique farmland, and other areas of critical environmental concern.

Expansive clays - Clays that shrink and swell under changing moisture regimes.

Fall line - An imaginary line, marked by waterfalls and rapids, where rivers descend abruptly from an upland to a lowland.

Federal candidate species - A species that is being considered for listing as a federally threatened or endangered species.

Floodplains - That portion of a river, stream, or creek valley adjacent to the channel that is covered with water when the river, stream, or creek overflows its banks at flood stages.

100-year floodplain - That portion of the floodplain that has a 1 percent chance of flooding during a storm event in any given year.

Fluvial - Of or pertaining to rivers.

Fluvial-deltaic - River deltas where sediments were deposited.

Footprint - The actual shape, size, and location of a structure's foundation on a construction site.

Formal screening process - Procedure to follow for disposing of military installations closed under P.L. 100-526.

Genetic corridor - A band of native vegetation that allows for the movement of species between larger patches of habitat, thus allowing species to survive in landscapes where they would not normally occur.

Highest and best use - That use, from among reasonable, probable, and legal alternative uses, found to be physically possible, appropriately supported, financially feasible, and results in the highest land-use value.

Historic resource - Historic structures and archeological sites that are dated after 1607 AD.

Infrastructure - The utilities and road networks required to support an area.

Metamorphic rocks - Includes all those rocks that have formed in the solid state in response to temperature, pressure, and the chemical environment. These effects take place, in general, below the ground.

Mitigation - All measures planned to minimize or offset expected significant environmental impacts.

Non-tidal wetlands - Those areas above the limit of tidal influence that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that do support, a prevalence of vegetation typically adapted for life in saturated-soil conditions.

Notice of Intent (NOI) - Public notice advertising the lead agency's intent to prepare an EIS for a proposed action. The NOI is published in the *Federal Register* and appropriate newspapers in the localities affected by the proposed action.

Paleozoic - One of the eras of geologic time; also refers to the rocks deposited during the Paleozoic Era, which occurred 570 to 280 million years ago.

Palustrine emergent wetlands - Freshwater wetlands that are dominated by herbaceous (non-woody) plants.

Palustrine forested wetlands - Freshwater wetlands that are dominated by woody vegetation 20 feet or taller.

Piedmont - Lying or formed at the base of mountains.

Phase I Cultural Resource Survey - Preliminary reconnaissance to determine the potential for historic and archeologic sites in an area. This preliminary survey may include shovel tests.

Phase II Cultural Resource Survey - Evaluation to determine the eligibility of a site for listing in the National Register of Historic Places. This survey may include formal archeologic digs.

Phase III Cultural Resource Survey - The removal, preservation, and cataloging of artifacts from a cultural resource site.

Physiography - The study of genesis and evolution of land forms.

Phytoplankton - One-celled microscopic plants that live in water.

Polychlorinated biphenyl (PCB) - Synthetic lubricant used in electrical parts, especially transformers.

Potentially significant impact - An effect that has a reasonable likelihood, but not a certainty, of occurring. It is treated as a significant effect, requiring identification of possible mitigation measures.

Precambrian - All rocks formed before the Cambrian (more than 570 million years ago) period.

Realign/realignment - The movement of military activities from one location to another.

Record of Decision (ROD) - Final documentation prepared as part of an EIS. The ROD states the decision reached on the proposed action that is described and analyzed in the EIS; identifies and discusses all factors that were weighed during the decision making process; states how these considerations affected the final decision; and states if all practicable means to avoid or minimize environmental harm from the selective alternative have been adopted, and if not, why they were not.

Relief - The difference in elevation between the high and low points of a land surface.

Resource Site - Location where a resource, such as an endangered species, or archeologic or historic find, is found.

Runoff - The overland discharge of water through surface streams. A significant source of non-point source pollution because runoff can cause or increase erosion and transport sediments (and therefore nutrients) as well as pesticides, herbicides, and oil from other surfaces into water bodies, degrading water quality.

Schist - A medium- or coarse-grained metamorphic rock.

Scrub/shrub wetlands - Wetlands dominated by woody plants less than 20 feet tall.

Sediment - Solid material, both mineral and organic, that is in suspension, or has been transported or moved from its site of origin by air, water, or ice. Sediment usually contains nutrients or pollutants that contribute to the degradation of water quality.

Sedimentation - Process by which sediment is deposited in water bodies, often causing constriction or cessation of surface water flow. Sandbars and other upland areas are also created in surface water bodies by this process.

Sedimentary - Rocks formed from sediment, especially sandstones and shales.

Significant impact - Impacts that violate existing pollution standards; cause water, air, noise, soil, or underground pollution; impair visibility for substantial periods of any day; cause interference with the reasonable peaceful enjoyment of property; interfere with visual or auditory amenities; limit multiple-use management programs for an area; cause danger to the health, safety, or welfare of humans; or cause irreparable harm to animal or plant life in an area.

Species of concern - Species that are not listed as threatened or endangered, or considered as candidates for imminent listing, but species that could become candidates or eligible for listing if populations continue to decline throughout all or a significant portion of their ranges.

Specimen-sized trees - Mature trees that are at or near the maximum size recorded for the species as determined by the state Department of Forestry.

Statement of Condition - Report prepared by USATHAMA describing the condition of a property after their remedial actions and investigations.

Submerged aquatic vegetation (SAV) - Vascular plants that grow completely submerged or just up to the surface of the water.

Terrestrial biota - Organisms that spend the predominance of their lives on land, including birds, lizards, and most mammals.

Triassic - The earliest of the three periods of the Mesozoic Era; or the layers of rock and soils deposited during that time (240 to 205 million years ago).

Threatened species - Any species that is likely to become endangered within the foreseeable future throughout all or a significant portion of its range.

Topography - The physical features of a district or region, especially the relief and contour of the land.

Visual resources - Aesthetically pleasing aspects of the natural or man-made environment.

Wetlands - Those areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

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Buffer — 4.2.1.2.2, 4.2.1.1.4, 4.2.1.1.3, 4.2.2.1.3, 4.2.2.2.1.3, Fig. 80, 4.2.2.2, 4.2.2.3, 4.6.13
Development in — 4.2.1.2.2

Retention and settling (settling and retention) basin for water-borne sediments, sedimentation — 4.1.1.4, 4.2.2.1.4

Reuse Task Force — 2.7, 2.3.2

River Village — *see* AFH 6

Rossel Loop — *see* AFH 12

Runoff — *see* Stormwater runoff

S

SAVs — *see* Submerged aquatic vegetation

Seabee Operational Storage Facility — *see* MCA 18

Sedimentation
Control 4.2.1.2.3 — 4.1.1.4, 4.2.2.1.4, 4.2.1.2.2

Sediment transport — *see* Sedimentation control

Soil erosion and sedimentation — 4.2.1.1.3

Soldiers Magazine publications office — 2.4.2, 2.5.3

Species of concern — 3.2.2.4

State Water Pollution Control Board — 3.1.5

Steep slopes — 3.5.2.1, 4.2.1.2.2, 4.2.1.1.3

Stormwater runoff — 3.2.1.4, 4.2.1.2.2

Submerged aquatic vegetation (SAV) — 3.2.2.3, 4.2.2.2.3

T

Tactical Energy Systems Lab — *see* MCA 35

Telephone Switch Upgrade, Post-wide — *see* MCA 8

Temporary Lodging Facility — *see* NAF 8

Timbering — *see* Forest management

Tompkins Basin Armed Forces Recreation Area — *see* NAF 2

Transportation analysis — 3.2.3.8, 4.2.3.8, *see also* Regional transportation plan

U

Underground storage tanks (USTs) — 4.1.5

Undeveloped Land
Fort Belvoir — 3.2.2.1

U.S. Army Environment and Hygiene Agency (USAEHA) — 3.1.5

U.S. Army Materiel Command (AMC) — 1.3, 3.4, 4.2.2.2.1

U.S. Army Toxic and Hazardous Materials Agency (USATHAMA) — 3.1.1.1, 3.1.5, 3.2.5, 4.1.5, 4.2.1.5

USTs — *see* Underground storage tanks

V

Veterinary Clinic — *see* MCA 6

Virginia Commission of Game and Inland Fisheries — 3.2.1.4

Virginia Department of Air Pollution Control (DAPC) — 3.1.1.5, 3.2.1.5, 3.3.1.5

Virginia Department of Historic Resources (VDHR) — 3.2.4

Virginia Department of Transportation (VDOT) — 3.2.3.7.1.2

Virginia Army National Guard Armory/Headquarters (29th LID) — *see* MCA 15

Virginia Sediment and Erosion Control Handbook — 4.2.1.1.4, 4.2.2.4

Virginia State Water Control Board (SCWB) — 3.1.1.4

Visiting Officers' Quarters Renovation — *see* AFH 9

W

Warehouses — *see* MCA 34

Wetlands — 3.1.2.2, 3.2.2.2, 3.3.2.2, 3.4.2.2, 3.5.2.1, 4.2.1.2.2, 4.2.2.2.2, 4.3.2.2, 4.5.2.1.3, 4.6.2.2

Wildlife corridor — 3.2.2.1.1

Wildlife genetic corridor — *see* Genetic corridor

Wildlife refuges — *see* Accotink Bay, Jackson Miles Abbott

Woodlawn Friends Meeting House — 3.2.4.1.1, 3.2.4.1.2

Wood turtles — 4.2.1.2.4, 4.2.2.2.4

Y

Youth Center — *see* NAF 1

WDCR504/034.51

APPENDIX A

Agency Coordination

Appendix A
AGENCY COORDINATION

Copies of the *Comprehensive Base Realignment/Closure and Fort Belvoir Development Draft Environmental Impact Statement* were sent to the following for review and comments:

FEDERAL AGENCIES

Honorable John W. Warner
U.S. Senate

Honorable Charles S. Robb
U.S. Senate

Honorable Jesse Jackson
U.S. House of Representatives

Honorable Frank Wolf
U.S. House of Representatives

Honorable James Moran
U.S. House of Representatives

Dr. Robert D. Bush
Executive Director
Advisory Council on Historic Preservation

Commander
Fifth Coast Guard District

Ms. Patricia E. Bentley
Mid-Atlantic Region
National Park Service

Major O'Shea
Office of Legislative Liaison
U.S. Department of Defense

Ms. Millicent Grant
U.S. Department of Housing and Urban Development

Lt. Col. Leonard Hassell
Office of Economic Adjustment
U.S. Department of Defense

Mr. Charles S. Spooner
U.S. Environmental Protection Agency

Mr. Ronald E. Lambertson
Regional Director
U.S. Fish and Wildlife Service

Mr. John LeVay
Director
Community Planning and Development

Dr. Edward W. Christoffers
National Marine Fisheries Service

Mr. Ronald Wrye
Director, National Capital Region
National Park Service

Mr. Charles Custard
Director
Office of Environmental Affairs
U.S. Department of Health and Human Services

Mr. Jonathan Deason
Director
Office of Environmental Project Review
U.S. Department of the Interior

Dr. Edwin B. Erickson
Administrator
Region III
U.S. Environmental Protection Agency

Ms. Phoebe Robb
N.E.P.A./309 Team Leader
U.S. Environmental Protection Agency

Mr. John Wolflin
U.S. Fish and Wildlife Service

Ms. Gail Moore
U.S. General Accounting Office

Mr. Herb Freiberg
Chief
Mid-Atlantic District
U.S. Geological Survey

STATE AGENCIES

Honorable Douglas Wilder
Governor
Commonwealth of Virginia

Mr. Jeter M. Watson
Executive Director
Chesapeake Bay Local Assistance Department

Ms. Katie Perry
Virginia Natural Heritage Program
Department of Conservation and Recreation

Mr. G. Mark Gibb
Executive Director
Northern Virginia Planning District Commission

Mr. Richard Kampf
Virginia State Liaison Office
U.S. Environmental Protection

Mr. Keith J. Buttleman
Administrator
Virginia Council on the Environment

Mr. B. C. Leynes, Jr.
Director
Virginia Department of Conservation and Recreation

Mr. Scott Eubanks
Director
Department of Economic Development

Dr. Temple Bayliss
Director
Division of Energy

Mr. George C. Norris
Virginia State Conservationist
U.S. Department of Agriculture

Mr. Gary Anderson
Chief
Virginia State Office

Mr. Wallace N. Davis
Executive Director
Virginia Department of Air Pollution Control

Mr. Brad Bristow
Executive Director
Virginia Department of Game and Inland Fisheries

Mr. Eric H. Bartsch
Director
Office of Water Programs
Virginia Department of Health

Mr. Bruce Larson
Compliance Officer
Virginia Department of Historic Resources

Ms. Cynthia Bailey
Executive Director
Virginia Department of Waste Management

Mr. S. Mason Carbaugh
Commissioner
Virginia Department of Agriculture and Consumer Services

Dr. Frank O. Perkins
Director
Virginia Institute of Marine Science

Mr. William A. Pruitt
Commissioner
Virginia Marine Resources Commission

Mr. Richard N. Burton
Executive Director
Virginia State Water Control Board

Mr. Hugh C. Miller
Executive Director
Virginia Department of Historic Resources

Mr. Vladimir Gulevich
Technical Services Division
Virginia Department of Waste Management

Mr. Ronald D. Sutton
Commissioner, Division of State Parks
Virginia Department of Conservation and Recreation

Mr. Robert W. Grabb
Chief
Habitat Management Division
Virginia Marine Resources Commission

Mr. Dale F. Jones
Office of Water Resources Planning
Virginia State Water Control Board

REGIONAL AGENCIES (Washington Metropolitan Area)

Ann Pesiri Swanson
Director
Chesapeake Bay Commission

Mr. Walter A. Scheiber
Executive Director
Metropolitan Washington Council of Governments

Mr. Reginald W. Griffith
Executive Director
National Capital Planning Commission

George Lambert
Northern Virginia Urban League

Washington Metro Area Transit Authority

Mr. Lee Zeni
Executive Director
Interstate Commission on the Potomac River Basin

Mr. Jay Langford
Chief
Planning and Analysis
Metropolitan Washington Council of Governments

Mr. Puller A. Hughes
District Executive
Northern Virginia Soil and Water Conservation District

Mr. Gerald R. Calhoun
Manager
Chesapeake Bay Liaison Office
Soil Conservation Service

LOCAL AGENCIES in the Fort Belvoir Area

Charolette Branch
Executive Director
Saunders B. Moon Community Action Center

Environmental Quality Control Advisory Council

Mr. J. Hamilton Lambert
County Executive
Fairfax County

Mrs. Audrey Moore
Chairman
Fairfax County Board of Supervisors

Mr. Joseph Alexander
Supervisor
Lee District
Fairfax County Board of Supervisors

Mr. Gerald Hyland
Supervisor
Mount Vernon District
Fairfax County Board of Supervisors

Ms. Elaine McConnell
Supervisor
Springfield District
Fairfax County Board of Supervisors

Mr. Richard King
Deputy
Fairfax County Executive for Public Safety

Mr. Michael Hines
Fairfax County Office of Comprehensive Planning

Mr. Robert L. Moore
Fairfax County Office of Transportation

Mr. Bob Kuhns
Fairfax County Office of Transportation

Mr. James A. Heberlien
Assistant Administrator
Fairfax County Park Authority

Ms. Jayne Collins
Fairfax County Park Authority

Mr. George M. Lilly
Chairman
Fairfax County Planning Commission

Mr. Carl Sell
Fairfax County Planning Commission

Mr. Peter F. Murphy
Fairfax County Planning Commission

Dr. Robert Spillane
Superintendent of Schools
Fairfax County Public Schools

Mr. Walter D. Webdale
Executive Director
Fairfax County Redevelopment and Housing Authority

Mr. Dennis Hill
Sanitation Supervisor
Division of Environmental Health
Fairfax County

LOCAL AGENCIES in the Cameron Station Area

Dr. Steven J. Shephard
Alexandria Archaeology

Ms. Diane Charles
Alexandria City Councilman Kerry Donley, Office of

Mr. Ken Foran
Alexandria Parks and Recreation

Mr. Angus T. Olson
Executive Director
Alexandria Redevelopment and Housing Authority

Mr. Thomas O'Kane
Director
Alexandria Transportation and Environmental Services

Mr. Donald Fowler
Alexandria Transportation Planning Board

Alexandria Volunteer Bureau

Mr. John Sullivan
Representative
Alexandria Federation of Civic Associations
Cameron Station Task Force

Mr. James R. Mulligan
Alexandria Park and Recreation Commission Representative
Cameron Station Task Force

Mr. Kerry Donley
Alexandria City Council/Co-Convener
Cameron Station Task Force

Ms. Redella Pepper
Alexandria City Council/Co-Convener
Cameron Station Task Force

Mr. Daniel Burns
Representative
Chamber of Commerce Representative
Cameron Station Task Force

Mr. Melvin Johnsrud
Citizen Representative
Cameron Station Task Force

Mr. James Marx
Citizen Representative
Cameron Station Task Force

Converse M. West
Citizen Representative
Cameron Station Task Force

Col. and Mrs. Bernard Brenman
Representative
Holmes Run Committee
Cameron Station Task Force

Mr. Phil Sunderland
City Attorney
City of Alexandria

Ms. Jeanne Yang
Facilities Services
Fairfax County Public Schools

Mr. Henry Howard
Deputy City Manager
City of Alexandria

Mr. Shiva Pant
Director
Office of Transportation

Letters were received from the following agencies in response to agency coordination, which was initiated by the Department of the Army in the summer of 1989.

WDCR233/065.51

COMMONWEALTH of VIRGINIA

Council on the Environment

KEITH J. ROTTELMAN
ADMINISTRATOR

[illegible] STREET OFFICE BUILDING
[illegible]

October 17, 1989

Lt. Col. Carl B. Barnes, Jr.
Acting District Engineer
Baltimore District
U.S. Army Corps of Engineers
Attn: CENAB-PL-ES
P.O. Box 1715
Baltimore, Maryland 21203

Dear Colonel Barnes:

This agency has reviewed the EIS Scoping Notice for the Comprehensive Base Realignment/Closure and Fort Belvoir Development (Public Notice PL-E-89-16). The Council on the Environment is responsible for coordinating Virginia's review of federal environmental documents and responding to appropriate federal officials on behalf of the Commonwealth.

The activities proposed in this Public Notice, and their locations at Fort Belvoir and surrounding areas, raise environmental issues which are similar to those raised by the Corps's recent Public Notices PL-E-89-9 and PL-E-89-10, which we reviewed together with other agencies of the Commonwealth. We believe that our comments on those Notices, which were mailed on August 28, would be instructive to the Corps as it prepares the EIS contemplated in Public Notice PL-E-89-16. Accordingly, copies of our August 28 correspondence are attached for your information and use.

If you have questions regarding these comments, please feel free to call this office or any of the agencies cited in the enclosures.

Thank you for the opportunity to comment.

Sincerely,

Hannah Crew

(for Keith J. Buttleman)

Enclosures

cc: The Honorable John W. Daniel, II
Mr. Darryl M. Glover, CBLAD
Mr. C. E. Easlick, SWCB
Mr. John R. Davy, Jr., DCR
Mr. William W. Erskine, DAPC
Mr. Bruce J. Larson, DHR
Ms. Sarah D. Pugh, DACS
Mr. Harry E. Gregori, Jr., DWM
Mr. William E. Neal, DGIF
Dr. Robert B. Stroube, SDH
Mr. Robert H. Blackman, VDOT
Mr. David Coffman, DF
Mr. R. Mark Gibb, Northern Virginia PDC
Mr. James Zook, Fairfax County

COMMONWEALTH of VIRGINIA

KEITH J. BUTTLEMAN
ADMINISTRATOR

Council on the Environment

903 NINTH STREET OFFICE BUILDING
RICHMOND 23219
804-786-4500

August 28, 1989

Colonel Bernard E. Stalmann
Baltimore District Engineer
U.S. Army Corps of Engineers
Attn: CENAB-PL-ES
P.O. Box 1715
Baltimore, Maryland 21203

Dear Colonel Stalmann:

The Commonwealth of Virginia has completed its review of the EIS Scoping Notice for the relocation of AMC Headquarters to Fort Belvoir (Public Notice PL-E-89-10, Army Materiel Command Headquarters at Fort Belvoir, Virginia, Environmental Impact Statement). The Council on the Environment is responsible for coordinating Virginia's review of federal environmental documents and responding to appropriate federal officials on behalf of the Commonwealth. The following agencies joined in this review:

Department of Agriculture and Consumer Services
Department of Health
Department of Air Pollution Control
Chesapeake Bay Local Assistance Department
Department of Historic Resources
Department of Forestry
State Water Control Board.

In addition, the following agencies, planning district commission, and locality were invited to comment:

Department of Game and Inland Fisheries
Department of Conservation and Recreation
Department of Waste Management
Department of Transportation
Northern Virginia Planning District Commission
Fairfax County.

The comments which follow are organized according to basic components of a federal environmental impact statement. Distinctions between the three categories of actions proposed in the scoping notice are addressed as appropriate.

Purpose and Need

The relationship of the relocation of Army Materiel Command (AMC) headquarters to Fort Belvoir and the other realignments and development contemplated in your Public Notice PL-E-89-9 on base closure and realignment should be described in the EIS. In addition, the EIS should explain the inadequacies referred to in the scoping notice. Directives from higher Army commands or from Congress concerning the relocation should also be mentioned in this section if applicable.

Affected Environment

Discussion of the affected environment in the Draft EIS should cover the areas of Fort Belvoir where changes in land use attributable to the relocation of the AMC are proposed, and where effects of those changes might be experienced. This section should take account of areas that fit definitions, under Virginia's Chesapeake Bay Preservation Act (*Virginia Code* sections 10.1-2103 and 10.1-2107), of Chesapeake Bay Preservation Areas. We will be particularly interested in how the proposed activities would affect the following types of areas which are termed Resource Protection Areas: tidal wetlands; non-tidal wetlands connected by surface flow and contiguous to tidal wetlands or perennial streams; tidal shores; any other lands at or near the shoreline which a local government determines to have intrinsic water quality value; and a 100-foot wide vegetated buffer area adjacent to and landward of any of these areas and along both sides of any tributary stream. The regulations developed pursuant to the Act contemplate that local governments will identify these areas and implement performance criteria for development therein. We are enclosing the criteria for your use in carrying out the realignment proposals mentioned in the scoping notice; as you know, the federal government is a partner with Virginia and other state governments in the 1987 Chesapeake Bay Agreement which gave rise, in Virginia, to the 1988 legislation authorizing the promulgation of these definitions and criteria.

Alternatives Including the Proposed Actions

The discussion of alternatives in the Draft EIS should, of course, include the "no-action" alternative. It should also include different scenarios intended to carry out the purpose of the AMC move, which is, we presume, to provide for adequate and economical headquarters. These scenarios might logically include office space in Washington, D.C. as well as at suburban sites such as Fort Belvoir. Among the factors influencing the formulation of alternatives should be environmental impact, energy use, transportation, and capital and operating costs as well as the need for space and the convenience of starting over at the North Post area of Fort Belvoir.

Environmental Consequences and Mitigation

We expect that the Draft EIS will, in light of the description of the affected environment therein, provide a rigorous analysis of the impacts of the alternatives and commit the Army not only to the requirements of the National Environmental Policy Act and Army Regulation 200-2 (which implements NEPA) but also to effective mitigation measures which include an environmentally preferable alternative and design factors intended to carry out the purposes of the Chesapeake Bay Agreement of 1987. Under that Agreement, federal and state governments have committed themselves to implementing development projects so as not to harm the water quality or living resources of the Chesapeake Bay or its tributaries. Some specific guidelines follow.

1. Impacts and Mitigation

In the area of water resource impacts, preparation of the Draft EIS should be guided by the attached Supplemental Guidelines provided by the State Water Control Board. Some items of particular interest should be noted. First, consideration of erosion and sediment controls should include stormwater runoff management (item 2); the measures developed to address runoff and erosion should meet the standards and General Criteria in the Virginia Erosion and Sediment Control Handbook. The Handbook, published by the Department of Conservation and Recreation's Division of Soil and Water Conservation (telephone (804) 786-2604), is applicable to projects of this scope pursuant to the Virginia Erosion and Sediment Control Law (*Va. Code* section 10.1-560 et seq.).

Because of the archaeological potential of the Fort Belvoir land area and the likely impacts of the project upon archaeological resources, a Phase I archaeological survey is required pursuant to the National Historic Preservation Act of 1966.

Fort Belvoir may also have standing structures that are eligible for listing on the National Register of Historic Places. Accordingly, we recommend that a survey for such structures be accomplished prior to the commencement of development activities.

There is considerable undeveloped land within the confines of Fort Belvoir and in its vicinity. The Draft EIS should analyze the effects of development on the wildlife inhabiting this land, specifying whether any wildlife species are endangered or threatened, and indicating what will be done to assure that such species are not put in jeopardy. The same guidance applies for endangered plant species.

If the use of pesticides is contemplated, the Draft EIS should so state; and it should commit the Army to formulate a pesticide usage plan designed to mitigate or eliminate threats to the environment and to worker safety from pesticide use.

The impacts of AMC relocation to Fort Belvoir should be considered and analyzed in light of the proposed realignment of functions to Fort Belvoir from other Army units and the developments that are contemplated in that framework (see Public Notice PL-E-89-9 and our comments thereon). The cumulative impacts of these two undertakings may necessitate reconsideration or modification of one or both of them.

2. Regulatory and Coordination Needs

The following state requirements are or may be applicable to this project. The Draft EIS should indicate an understanding of and commitment to follow the requirements which pertain to the project.

a. Archaeological survey (see above). The Phase I archaeological survey should be completed and the resulting survey report submitted to the Department of Historic Resources (221 Governor Street, Richmond, Virginia 23219) for review and approval before any land disturbance takes place. For guidance on archaeological surveys and contractors, please call the Department (telephone (804) 786-3143).

b. Standing structures survey (see above). For guidance on a standing structures survey, please contact the Department of Historic Resources (above).

c. Fugitive dust. The Department of Air Pollution Control, pursuant to Rule 5-1, requires that adequate measures be taken to control fugitive dust resulting from land clearing, excavation, and construction. These measures include wetting of disturbed earth, covering truckloads of materials and dirt, and washing down public roads used by construction equipment.

d. Open burning. Open burning of vegetative debris from land clearing is prohibited in the Fort Belvoir area. For questions relating to burning of other materials, please contact the Department of Air Pollution Control's regional office in Springfield (telephone (703) 644-0311).

e. New sources. The Department of Air Pollution Control requires permit application review for setting up and operating devices which may give rise to air pollution. These devices include boilers. incinerators, rock crushers, concrete batching plants, asphalt paving manufacturing plant, and processors. To acertain the requirements for permit applications, please contact the Springfield office of the Department (see above).

f. Erosion and sediment control. To ascertain requirements applicable to Fort Belvoir, or to obtain a copy (at cost) of the Virginia Erosion and Sediment Control Handbook, please contact the Division of Soil and Water Conservation (telephone (804-786-2604).

g. Best Management Practices. The Division (above) also provides BMP Handbooks prepared by the State Water Control Board for use in preventing contamination of waterways attributable to land development activities.

h. Draft EIS distribution. To assure distribution of the Draft EIS to state agencies, Fairfax County, and the Northern Virginia Planning Distribution, you may call us (telephone (804) 786-4500) before mailing copies to Virginia entities. We estimate that 18 copies will serve the needs of these entities.

i. Chesapeake Bay Preservation Areas. For additional advice concerning the areas that fit this definition, please contact the Chesapeake Bay Local Assistance Department (telephone (804) 225-3440).

Thank you for the opportunity to contribute to this scoping effort.

Sincerely,

Hannah Crew

(for Keith J. Buttleman)

Enclosures

cc: The Honorable John W. Daniel, II
Mr. Darryl M. Glover, CBLAD
Mr. C. E. Easlick, SWCB
Mr. John R. Davy, Jr., DCR
Mr. William W. Erskine, DAPC
Mr. Bruce J. Larson, DHR
Ms. Sarah D. Pugh, DACS
Mr. Harry E. Gregori, Jr., DWM
Mr. William E. Neal, DGIF
Dr. Robert B. Stroube, SDH
Mr. Robert H. Blackman, VDOT
Mr. David Coffman, DF
Mr. R. Mark Gibb, Northern Virginia PDC
Mr. James Zook, Fairfax County

COMMONWEALTH of VIRGINIA

CHESAPEAKE BAY LOCAL ASSISTANCE DEPARTMENT

701 Eighth Street Office Building
Richmond, Virginia 23219 (804) 225-3440

Jeter M. Watson
Executive Director



July 28, 1989

MEMORANDUM

To: Mr. Charlie Ellis/ Ms. Ellie Irons
Council on the Environment

From: Darryl M. Glover

Re: Scoping Notice - Army Material Command Relocation to Fort Belvoir - Army Corps of Engineers Project Number 754

We have reviewed the scoping notice for development of an environmental impact statement submitted to us on July 18, 1989 for the proposed relocation by the Army Material Command from Alexandria, Virginia to Fort Belvoir.

Both the 1987 Chesapeake Bay Agreement and the Coastal Zone Management Program have federal consistency provisions. As such our agency is interested in those aspects of the environmental impact statement which would address impacts to Chesapeake Bay Preservation Areas as defined by the criteria approved by the Chesapeake Bay Local Assistance Board on June 28, 1989.

Although subject to the remainder of the Administrative Process, the criteria may become effective on September 1, 1989. As defined the criteria require localities within Tidewater, Virginia (those localities on or east of the fall line), to designate two tiers of Chesapeake Bay Preservation Areas within twelve months of June 28. The most environmentally sensitive of these areas are termed Resource Protection Areas. If any exist, this agency would be particularly interested to know how activities might impact: tidal wetlands; nontidal wetlands connected by surface flow and contiguous to tidal wetlands or tributary (perennial) streams; tidal shores; any other lands at or near the shoreline which a local government determines to have intrinsic water quality value; and a 100 foot wide vegetated buffer area located adjacent to and landward of the above noted

components of Resource Protection Areas as well as along both sides of any tributary stream. The buffer may be reduced to a 50 foot width for lots recorded prior to the effective date where the loss of a buildable area would otherwise result. Properly surfaced access paths and some other modifications are also allowed within the buffer area by the criteria. The criteria otherwise call for only water-dependent facilities and redevelopment of existing developed areas within most Resource Protection Areas. This is in order to preserve the water quality benefits which are intrinsic to these landforms due to biological or ecological functions which they perform.

Landward of Resource Protection Areas, the criteria require localities to designate a Resource Management Area along the entire boundary of the Resource Protection Area. What the Resource Management Area includes is left to local discretion but localities shall consider the following landforms for designation: the 100 year floodplain; highly erodible soils, including steep slopes, with a erodibility index from sheet and rill erosion greater than eight; highly permeable soils with water movement greater than six inches per hour within the first 72 inches; nontidal wetlands not included within Resource Protection Areas; and other such lands which a locality determines to have a potential for causing significant water quality degradation or for diminishing the functional value of the Resource Protection Area if improperly used or developed. There are no restrictions on the types of development within Resource Management Areas other than local zoning and existing applicable permits.

There are performance criteria to be implemented within Chesapeake Bay Preservation Areas. Stormwater management resulting in no-net increase in nonpoint source pollution for new development and erosion and sediment controls for disturbances larger than 2500 square feet are the principal concerns. A copy of the criteria are enclosed for transmittal to the Corps.

Thank you for the opportunity to comment on the development of the environmental impact statement. If you have any questions concerning these comments please call me at (SCATS) 371-7501 or (804) 371-7501.

Sincerely,

Darryl M. Glover

Darryl M. Glover
Environmental Engineer

DMG/dmg
ENCLOSURES:
cc: Mr. C. Scott Crafton

7-12-89

CHESAPEAKE BAY LOCAL ASSISTANCE BOARD

FINAL REGULATION: VR 173-02-00. Chesapeake Bay Preservation Area Designation and Management Regulations.

PART I.
INTRODUCTION

§ 1.1. Application.

The board is charged with the development of regulations which establish criteria that will provide for the protection of water quality, and that also will accommodate economic development. All counties, cities, and towns in Tidewater Virginia shall comply with these regulations. Other local governments not in Tidewater Virginia may use the criteria and conform their ordinances as provided in these regulations to protect the quality of state waters in accordance with Code § 10.1-2110.

§ 1.2. Authority for regulations.

These regulations are issued under the authority of §§ 10.1-2103 and 10.1-2107 of Chapter 21, Title 10.1 of the Code of Virginia (the Chesapeake Bay Preservation Act, hereinafter "the Act").

§ 1.3. Purpose of regulations.

These regulations establish the criteria that counties, cities, and towns (hereinafter "local governments") shall use to determine the extent of the Chesapeake Bay Preservation Areas within their jurisdictions. These regulations establish criteria for use by local governments in granting, denying, or modifying requests to rezone, subdivide, or to use and develop land in Chesapeake Bay Preservation Areas. These regulations identify the requirements for changes which local governments shall incorporate into their comprehensive plans, zoning ordinances, and subdivision ordinances to protect the quality of state waters pursuant to §§ 10.1-2109 and 10.1-2111 of the Act.

§ 1.4. Definitions.

The following words and terms used in these regulations have the following meanings, unless the context clearly indicates otherwise. In addition, some terms not defined herein are defined in § 10.1-2101 of the Act.

"Act" means the Chesapeake Bay Preservation Act found in Chapter 21 (§ 10.1-2100 et seq.) of Title 10.1 of the Code of Virginia.

"Board" means the Chesapeake Bay Local Assistance Board.

"Buffer area" means an area of natural or established vegetation managed to protect other components of a Resource Protection Area and state waters from significant degradation due to land disturbances.

"Chesapeake Bay Preservation Area" means any land designated by a local government pursuant to Part III of these regulations and § 10.1-2107 of the Act. A Chesapeake Bay Preservation Area shall consist of a Resource Protection Area and a Resource Management Area.

"Department" means the Chesapeake Bay Local Assistance Department.

"Development" means the construction, or substantial alteration of residential, commercial, industrial, institutional, recreational, transportation, or utility facilities or structures.

"Director" means the Executive Director of the Chesapeake Bay Local Assistance Department.

"Floodplain" means all lands that would be inundated by flood water as a result of a storm event of a 100-year return interval.

"Highly erodible soils" means soils (excluding vegetation) with an erodibility index (EI) from sheet and rill erosion equal to or greater than eight. The erodibility index for any soil is defined as the product of the formula RKLS/T, as defined by the "Food Security Act (F.S.A.) Manual" of August, 1988 in the "Field Office Technical Guide" of the U.S.D.A.-Soil Conservation Service, where K is the soil susceptibility to water erosion in the surface layer; R is the rainfall and runoff; LS is the combined effects of slope length and steepness; and T is the soil loss tolerance.

"Highly permeable soils" means soils with a given potential to transmit water through the soil profile. Highly permeable soils are identified as any soil having a permeability equal to or greater than six inches of water movement per hour in any part of the soil profile to a depth of 72 inches (permeability groups "rapid" and "very rapid") as found in the "National Soils Handbook" of July, 1983 in the "Field Office Technical Guide" of the U.S.D.A.-Soil Conservation Service.

"Impervious cover" means a surface composed of any material that significantly impedes or prevents natural infiltration of water into the soil. Impervious surfaces include, but are not limited to; roofs, buildings, streets, parking areas, and any concrete, asphalt, or compacted gravel surface.

"Local governments" means counties, cities, and towns. These regulations apply to local governments in Tidewater Virginia, as defined in § 10.1-2101 of the Act, but the provisions of these regulations may be used by other local governments.

"Local program" means the measures by which a local government complies with the Act and regulations.

"Local program adoption date" means the date a local government meets the requirements of subsections A and B of § 2.2 of Part II.

"Nontidal wetlands" means those wetlands other than tidal wetlands that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions, as defined by the U.S. Environmental Protection Agency pursuant to § 404 of the federal Clean Water Act, in 33 C.F.R. 328.3b, dated November 13, 1986, as amended.

"Plan of development" means any process for site plan review in local zoning and land development regulations designed to ensure compliance with § 10.1-2109 of the Act and these regulations, prior to issuance of a building permit.

"Redevelopment" means the process of developing land that is or has been previously developed.

"Resource Management Area" means that component of the Chesapeake Bay Preservation Area that is not classified as the Resource Protection Area.

"Resource Protection Area" means that component of the Chesapeake Bay Preservation Area comprised of lands at or near the shoreline that have an intrinsic water quality value due to the ecological and biological processes they perform or are sensitive to impacts which may result in significant degradation to the quality of state waters.

"Substantial alteration" means expansion or modification of a building or development which would result in a disturbance of land exceeding an area of 2,500 square feet in the Resource Management Area only.

"Tidal shore" or "shore" means land contiguous to a tidal body of water between the mean low water level and the mean high water level.

"Tidal wetlands" means vegetated and nonvegetated wetlands as defined in § 62.1-13.2 of the Code of Virginia.

"Tidewater Virginia" means those jurisdictions named in § 10.1-2101 of the Act.

"Tributary stream" means any perennial stream that is so depicted on the most recent U.S. Geological Survey 7-1/2 minute topographic quadrangle map (scale 1:24,000).

"Use" means an activity on the land other than development, including, but not limited to agriculture, horticulture, silviculture.

"Water-dependent facility" means a development of land that cannot exist outside of the Resource Protection Area and must be located on the shoreline by reason of the intrinsic nature of its operation. These facilities include, but are not limited to (i) ports; (ii) the intake and outfall structures of power plants, water treatment plants, sewage treatment plants, and storm sewers; (iii) marinas and other boat docking structures; (iv) beaches and other public water-oriented recreation areas, and (v) fisheries or other marine resources facilities.

PART II.
LOCAL GOVERNMENT PROGRAMS

§ 2.1. Local program development.

Local governments shall develop measures (hereinafter called "local programs") necessary to comply with the Act and regulations. Counties and towns are encouraged to cooperate in the development of their local programs. In conjunction with other state water quality programs, local programs shall encourage and promote: (i) protection of existing high quality state waters and restoration of all other state waters to a condition or quality that will permit all reasonable public uses and will support the propagation and growth of all aquatic life, including game fish, which might reasonably be expected to inhabit them; (ii) safeguarding the clean waters of the Commonwealth from pollution; (iii) prevention of any increase in pollution; (iv) reduction of existing pollution; and (v) promotion of water resource conservation in order to provide for the health, safety and welfare of the present and future citizens of the Commonwealth.

§ 2.2. Elements of program.

Local programs shall contain the elements listed below. Local governments shall adopt elements A and B concurrently and no later than 12 months after the adoption date of these regulations. Elements C through G should be in place within 24 months after the adoption date.

A. A map delineating Chesapeake Bay Preservation Areas.

B. Performance criteria applying in Chesapeake Bay Preservation Areas that achieve results at least equivalent to those provided by the criteria in Part IV.

C. A comprehensive plan or revision that incorporates the protection of Chesapeake Bay Preservation Areas and of the quality of state waters.

D. A zoning ordinance or revision that (i) incorporates measures to protect the quality of state waters in Chesapeake Bay Preservation Areas, and (ii) requires compliance with all criteria set forth in Part IV.

E. A subdivision ordinance or revision that (i) incorporates measures to protect the quality of state waters in Chesapeake Bay Preservation Areas, and (ii) assures that all subdivisions in Chesapeake Bay Preservation Areas comply with the criteria set forth in Part IV.

F. An erosion and sediment control ordinance or revision that requires compliance with the criteria in Part IV.

G. A plan of development process prior to the issuance of a building permit to assure that use and development of land in Chesapeake Bay Preservation Areas is accomplished in a manner that protects the quality of state waters.

PART III.
CHESAPEAKE BAY PRESERVATION AREA DESIGNATION CRITERIA

§ 3.1. Purpose.

The criteria in this part provide direction for local government designation of the ecological and geographic extent of Chesapeake Bay Preservation Areas. Chesapeake Bay Preservation Areas are divided into Resource Protection Areas and Resource Management Areas that are subject to the criteria in Part IV and the requirements in Part V. In addition, the criteria in this part provide guidance for local government identification of areas suitable for redevelopment that are subject to the redevelopment criteria in Part IV.

§ 3.2. Resource Protection Areas.

A. Resource Protection Areas shall consist of sensitive lands at or near the shoreline that have an intrinsic water quality value due to the ecological and biological processes they perform and are sensitive to impacts which may cause significant degradation to the quality of state waters.

B. As a minimum, the Resource Protection Area shall include:

1. Tidal wetlands;

2. Nontidal wetlands connected by surface flow and contiguous to tidal wetlands or tributary streams;

3. Tidal shores;

4. Such other lands under the provisions of subsection A of § 3.2 of this part necessary to protect the quality of state waters;

5. A vegetated buffer area located adjacent to and landward of the components listed in subsections 1 through 4 above, and along both sides of any tributary stream.

a. The purpose of the buffer area is to (i) provide for the removal or reduction of sediments, nutrients, and potentially harmful or toxic substances in runoff entering the Bay and its tributaries; and (ii) minimize the adverse effects of human activities on wetlands, shorelines, state waters, and aquatic resources.

b. The width of the buffer area shall be 100 feet. However, where the local government determines that the natural topography of the land within that 100 foot area is such that water drains away from the shore or other components of the Resource Protection Area, the buffer area shall consist only of the land that actually drains toward the shore or other components of the Resource Protection Area. In no case shall the buffer area have a width of less than 50 feet.

§ 3.3. Resource Management Areas.

A. Resource Management Areas shall include land types that, if improperly used or developed, have a potential for causing significant water quality degradation or for diminishing the functional value of the Resource Protection Area.

B. A Resource Management Area shall be provided contiguous to the entire inland boundary of the Resource Protection Area. The

following land categories shall be considered for inclusion in the Resource Management Area:

1. Floodplains;

2. Highly erodible soils, including steep slopes;

3. Highly permeable soils;

4. Nontidal wetlands not included in the Resource Protection Area;

5. Such other lands under the provisions of subsection A of § 3.3 of this part necessary to protect the quality of state waters.

C. Resource Management Areas shall encompass a land area large enough to provide significant water quality protection through the employment of the criteria in Part IV and the requirements in Parts II and V.

§ 3.4. Intensely Developed Areas.

At their option, local governments may designate Intensely Developed Areas as an overlay of Chesapeake Bay Preservation Areas within their jurisdictions. For the purposes of these regulations, Intensely Developed Areas shall serve as redevelopment areas in which development is concentrated while improving water quality. Areas so designated shall comply with the performance criteria for redevelopment in Part IV.

Local governments exercising this option shall examine the pattern of residential, commercial, industrial, and institutional development within Chesapeake Bay Preservation Areas. Areas of existing development and infill sites where little of the natural environment remains may be designated as Intensely Developed Areas provided at least one of the following conditions exist:

A. Development has severely altered the natural state of the area such that it has more than 50% impervious surface;

B. Public sewer and water is constructed and currently serves the area by the effective date. This condition does not include areas planned for public sewer and water;

C. Housing density is equal to or greater than 4 dwelling units per acre.

PART IV.
LAND USE AND DEVELOPMENT PERFORMANCE CRITERIA

§ 4.1. Purpose.

The purpose of this part is to implement the goals of the Act and Part II by establishing criteria to reduce nonpoint source pollution loads entering the Bay, its tributaries and other state waters, to protect the functional integrity of the Resource Protection Area, and to conserve water resources.

A. These criteria, or measures that achieve at least equivalent results, become mandatory upon the local program adoption date. They are supplemental to the various planning and zoning concepts employed by local governments in granting, denying, or modifying requests to rezone, subdivide, or to use and develop land in Chesapeake Bay Preservation Areas.

B. Local governments may exercise discretion in determining site-specific boundaries of Chesapeake Bay Preservation Area components and in making determinations of the application of these regulations, based on more reliable or specific information gathered from actual field evaluations of the parcel, in accordance with plan of development requirements in Part V.

§ 4.2. General performance criteria.

It must be demonstrated to the satisfaction of local governments that any use, development, or redevelopment of land in Chesapeake Bay Preservation Areas meets the following performance criteria:

1. No more land shall be disturbed than is necessary to provide for the desired use or development.

2. Indigenous vegetation shall be preserved to the maximum extent possible consistent with the use and development allowed.

3. Where the best management practices utilized require regular or periodic maintenance in order to continue their functions, such maintenance shall be ensured by the local government through a maintenance agreement with the owner or developer or some other mechanism that achieves an equivalent objective.

4. All development exceeding 2,500 square feet of land disturbance shall be accomplished through a plan of development review process consistent with § 15.1-491(h) of the Code of Virginia.

5. Land development shall minimize impervious cover consistent with the use or development allowed.

6. Any land disturbing activity that exceeds an area of 2,500 square feet (including construction of all single family houses, septic tanks and drainfields, but otherwise as defined in § 10.1-560 of the Code of Virginia) shall comply with the requirements of the local erosion and sediment control ordinance.

7. Stormwater management criteria at least as stringent as the following apply:

a. For development, the post-development nonpoint source pollution runoff load shall not exceed the pre-development load based upon average land cover conditions.

b. Redevelopment of any site that did not have best management practices incorporated into its existing development shall achieve a 10% reduction of nonpoint source pollution in runoff compared to the existing runoff load from the site. Post-development runoff from any redevelopment site that did incorporate best management practices into its existing development shall not exceed the existing load of nonpoint source pollution in surface runoff. These criteria shall apply to redevelopment whether or not it is located within an Intensely Developed Area designated by the local government.

c. The following options may be used to comply with the stormwater management criteria of these regulations:

(1) Incorporation on the site of best management practices that achieve the required control;

(2) Compliance with a locally adopted regional stormwater management program incorporating pro-rata share payments pursuant to the authority provided in § 15.1-466(j) of the Code of Virginia that results in achievement of equivalent water quality protection;

(3) Compliance with a state or locally implemented program of stormwater discharge permits pursuant to § 402(p) of the federal Clean Water Act, as set forth in 40 C.F.R. Parts 122, 123, 124, and 504, dated December 7, 1988 as amended;

(4) For a redevelopment site that was completely impervious as originally developed, restoring a minimum 20% of the site to vegetated open space.

d. Any maintenance, alteration, use, or improvement to an existing structure not changing or affecting the quality of surface water discharge, as determined by the local government, may be exempted from the requirements of this subsection.

8. Land upon which agricultural activities are being conducted, including but not limited to crop production, pasture, and dairy and feedlot operations, shall have a soil and water conservation plan that accomplishes water quality protection approved by the local Soil and Water Conservation District by January 1, 1995.

a. The board will request the Department of Conservation and Recreation to evaluate the existing state and federal agricultural conservation programs for effectiveness in providing water quality protection. In the event that, by July 1, 1991, the Department of Conservation and Recreation finds that the implementation of the existing agricultural conservation programs is inadequate to protect water quality, the board will consider the promulgation of regulations to provide more effective protection of water quality from agricultural activities and may require implementation of best management practices on agricultural lands within Chesapeake Bay Preservation Areas.

9. Silvicultural activities in Chesapeake Bay Preservation Areas are exempt from these regulations provided that silvicultural operations adhere to water quality protection procedures prescribed by the Department of Forestry in its "Best Management Practices Handbook for Forestry Operations." The Department of Forestry will oversee and document installation of best management practices and will monitor in-stream impacts of forestry operations in Chesapeake Bay Preservation Areas. In the event that, by July 1, 1991, the Department of Forestry programs are unable to demonstrate equivalent protection of water quality, the Department of Forestry will revise its programs to assure consistency of results and may require implementation of best management practices.

10. Local governments shall require evidence of all wetlands permits required by law prior to authorizing grading or other on-site activities to begin.

§ 4.3. Performance criteria for Resource Protection Areas.

The following criteria shall apply specifically within Resource Protection Areas and supplement the general performance criteria in § 4.2 of this part.

A. Allowable development.

A water quality impact assessment shall be required for any proposed development in accordance with Part V. Land development may be allowed only if it (i) is water dependent or, (ii) constitutes redevelopment.

1. A new or expanded water-dependent facility may be allowed provided that:

a. It does not conflict with the comprehensive plan;

b. It complies with the performance criteria set forth in this part;

c. Any non-water-dependent component is located outside of Resource Protection Areas;

d. Access will be provided with the minimum disturbance necessary. Where possible, a single point of access will be provided.

2. Redevelopment shall conform to applicable stormwater management and erosion and sediment control criteria in this part.

B. Buffer area requirements.

In order to satisfy the buffer area requirements, vegetation that is effective in retarding runoff, preventing erosion, and filtering nonpoint source pollution from runoff shall be established where it does not exist. Otherwise, the following performance criteria shall apply:

1. In order to maintain the functional value of the buffer area, indigenous vegetation may be removed only to provide for reasonable sight lines, access paths, general woodlot management, and best management practices, as follows:

a. Trees may be pruned or removed as necessary to provide for sight lines and vistas, provided that where removed, they shall be replaced with other vegetation that is equally effective in retarding runoff, preventing erosion, and filtering nonpoint source pollution from runoff;

b. Any path shall be constructed and surfaced so as to effectively control erosion;

c. Dead, diseased, or dying trees or shrubbery may be removed at the discretion of the landowner, and silvicultural thinning may be conducted based upon the recommendation of a professional forester or arborist;

d. The landward fifty feet of the buffer area may be used for the installation and continued maintenance of best management practices appropriate for the site;

e. On land where the local government has determined to designate a buffer area less than 100 feet wide due to the drainage pattern, as set forth in subdivision 5.b of subsection B of § 3.2 of Part III, provisions shall be made to ensure that surface runoff is filtered in a manner equivalent to that provided by the buffer area prior to entering state waters;

f. For shoreline erosion control projects, trees and woody vegetation may be removed, necessary control techniques employed, and appropriate vegetation established to protect or stabilize the shoreline in accordance with the best available technical advice and applicable permit conditions or requirements.

2. When the application of the buffer area would result in the loss of a buildable area on a lot or parcel recorded prior to the effective date of these regulations, modifications to the width of the buffer area may be allowed in accordance with the following criteria:

a. Modifications to the buffer area shall be the minimum necessary to achieve a reasonable buildable area for a principal structure and necessary utilities;

b. Where possible, an area equal to the area encroaching the buffer area shall be established elsewhere on the lot or parcel in a way to maximize water quality protection;

c. In no case shall the reduced portion of the buffer area be less than 50 feet in width.

3. Redevelopment within Intensely Developed Areas may be exempt from the requirements of this subsection. However, while the immediate establishment of the buffer area may be impractical, local governments shall give consideration to implementing measures that would establish the buffer in these areas over time.

4. In agricultural lands, the full 100 foot width of the buffer area shall be maintained where it presently exists and be established where it does not presently exist with either trees with a dense ground cover or other vegetation that is equally effective in retarding runoff, preventing erosion, and filtering nonpoint source pollution from runoff. The buffer area is not required for agricultural drainage ditches if the adjacent agricultural land has in place best management

practices in accordance with a conservation plan approved by the local Soil and Water Conservation District.

a. The agricultural buffer area shall be managed to prevent concentrated flows of surface water from breaching the buffer area and noxious weeds (such as Johnson grass, kudzu, and multiflora rose) from invading the buffer area;

b. The agricultural buffer area may be reduced to a minimum width of 50 feet when the landowner has implemented on the adjacent cropland a program of best management practices that improve water quality in accordance with a conservation plan approved by the local Soil and Water Conservation District, provided that the portion of the conservation plan being implemented for the Resource Protection Area achieves water quality protection at least the equivalent of that provided by the buffer area.

§ 4.4. Local program development.

Local governments shall incorporate the criteria in this part, or provisions at least the equivalent thereof, into their comprehensive plans, zoning ordinances, subdivision ordinances, and such other police and zoning powers as may be appropriate, in accordance with §§ 10.1-2111 and 10.1-2108 of the Act and Part V of these regulations. The criteria may be employed in conjunction with other planning and zoning concepts to protect the quality of state waters.

§ 4.5. Administrative waivers and exemptions.

A. Nonconforming use and development waivers.

1. Local governments may permit the continued use, but not necessarily the expansion, of any structure in existence on the date of local program adoption. Local governments may establish an administrative review procedure to waive or modify the criteria of this part for structures on legal nonconforming lots or parcels provided that:

a. There will be no net increase in nonpoint source pollutant load;

b. Any development or land disturbance exceeding an area of 2,500 square feet complies with all erosion and sediment control requirements of this part.

2. It is not the intent of these regulations to prevent the reconstruction of pre-existing structures within Chesapeake Bay Preservation Areas from

occurring as a result of casualty loss unless otherwise restricted by local government ordinances.

B. Public utilities, railroads, and facilities exemptions.

1. Construction, installation, operation, and maintenance of electric, gas, and telephone transmission lines, railroads, and roadways and their appurtenant structures in accordance with the Erosion and Sediment Control Law (§10.1-560 et seq. of the Code of Virginia) or an erosion and sediment control plan approved by the Virginia Soil and Water Conservation Board will be deemed to constitute compliance with these regulations.

2. Construction, installation, and maintenance of water, sewer, and local gas lines shall be exempt from the criteria in this part provided that:

a. To the degree possible, the location of such utilities and facilities should be outside Resource Protection Areas;

b. No more land shall be disturbed than is necessary to provide for the desired utility installation;

c. All such construction, installation, and maintenance of such utilities and facilities shall be in compliance with all applicable state and federal permits and designed and conducted in a manner that protects water quality;

d. Any land disturbance exceeding an area of 2,500 square feet complies with all erosion and sediment control requirements of this part.

C. Exemptions in Resource Protection Areas.

The following land disturbances in Resource Protection Areas may be exempt from the criteria of this part provided that they comply with subdivisions 1 and 2 below of this subsection: (i) water wells; (ii) passive recreation facilities such as boardwalks, trails, and pathways; and (iii) historic preservation and archaeological activities.

1. Local governments shall establish administrative procedures to review such exemptions;

2. Any land disturbance exceeding an area of 2,500 square feet shall comply with the erosion and sediment control requirements of this part.

§ 4.6. Exceptions to the criteria.

Exceptions to the requirements of these regulations may be granted, provided that: (i) exceptions to the criteria shall be the minimum necessary to afford relief, and (ii) reasonable and appropriate conditions upon any exception granted shall be imposed as necessary so that the purpose and intent of the Act is preserved. Local governments shall design an appropriate process or processes for the administration of exceptions, in accordance with Part V.

PART V.
IMPLEMENTATION, ASSISTANCE, AND DETERMINATION OF CONSISTENCY

§ 5.1. Purpose.

The purpose of this part is to assist local governments in the timely preparation of local programs to implement the Act, and to establish guidelines for determining local program consistency with the Act.

§ 5.2. Local assistance manual.

A. The Department will prepare a manual to provide guidance to assist local governments in the preparation of local programs in order to implement the Act and these regulations. The manual will be updated periodically to reflect the most current planning and zoning techniques and effective best management practices. The manual will be made available to the public.

B. The manual will recommend a schedule for the completion of local program elements and their submission to the board for its information, to ensure timely achievement of the requirements of the Act and timely receipt of assistance. The board will consider compliance with the schedule in allocating financial and technical assistance. Those elements of the manual necessary to assist local governments in meeting the first year requirements will be completed by the effective date of these regulations.

C. The manual is for the purpose of guidance only and is not mandatory.

§ 5.3. Board to establish liaison.

The board will establish liaison with each local government to assist that local government in developing and implementing its local program, in obtaining technical and financial assistance, and in complying with the Act and regulations.

§ 5.4. Planning District comments.

Local governments are encouraged to enlist the assistance and comments of regional planning district agencies early in the development of their local programs.

§ 5.5. Designation of Chesapeake Bay Preservation Areas.

A. The designation of Chesapeake Bay Preservation Areas as an element of the local program should:

1. Utilizing existing data and mapping resources, identify and describe tidal wetlands, nontidal wetlands, tidal shores, tributary streams, flood plains, highly erodible soils including steep slopes, highly permeable areas, and other sensitive environmental resources as necessary to comply with Part III.

2. Determine, based upon the identification and description, the extent of Chesapeake Bay Preservation Areas within the localjurisdiction.

3. Prepare an appropriate map or maps delineating Chesapeake Bay Preservation Areas.

4. Prepare amendments to local ordinances which incorporate the performance criteria of Part IV or the model ordinance prepared by the board.

B. Review by the board.

The board will review a proposed program within 60 days. If it is consistent with the Act, the board will schedule a conference with the local government to determine what additional technical and financial assistance may be needed and available to accomplish the proposed program. If not consistent, the board will notify the local government and recommend specific changes.

C. Adoption of first year program.

After being advised of program consistency, local governments shall hold a public hearing, delineate Chesapeake Bay Preservation Areas, on an appropriate map or maps, and adopt the performance criteria. Copies of the adopted program documents and subsequent changes thereto, shall be provided to the board.

§ 5.6. Preparation and submission of management program.

Local governments must adopt the full management program, including any revisions to comprehensive plans, zoning ordinances, subdivision ordinances, and other local authorities necessary to implement the Act, within 24 months of the adoption

date of these regulations. Prior to adoption, local governments may submit any proposed revisions to the board for comments. Guidelines are provided below for local government use in preparing local programs and the board's use in determining local program consistency.

A. Comprehensive Plans.

Local governments shall review and revise their comprehensive plans, as necessary, for compliance with § 10.1-2109 of the Act. As a minimum, the comprehensive plan or plan component should consist of the following basic elements: (i) a summary of data collection and analysis; (ii) a policy discussion; (iii) a land use plan map; (iv) implementing measures, including specific objectives and a time frame for accomplishment.

1. Local governments should establish an information base from which to make policy choices about future land use and development that will protect the quality of state waters. This element of the plan should be based upon the following:

a. Information used to designate Chesapeake Bay Preservation Areas;

b. Other marine resources;

c. Shoreline erosion problems and location of erosion control structures;

d. Conflicts between existing and proposed land uses and water quality protection;

e. A map or map series, accurately representing the above information.

2. As part of the comprehensive plan, local governments should clearly indicate local policy on land use issues relative to water quality protection. Local governments should ensure consistency among the policies developed.

a. Local governments should discuss each component of Chesapeake Bay Preservation Areas in relation to the types of land uses considered appropriate and the reasons for including each type of land use.

b. As a minimum, local governments should prepare policy statements for inclusion in the plan on the following issues:

(1) Physical constraints to development, including soil limitations, with an explicit discussion of soil suitability for septic tank use;

(2) Protection of potable water supply, including groundwater resources;

(3) Relationship of land use to commercial and recreational fisheries;

(4) Appropriate density for docks and piers;

(5) Public and private access to waterfront areas and effect on water quality;

(6) Existing pollution sources;

(7) Potential water quality improvement through the redevelopment of intensely developed areas.

c. For each of the policy issues listed above, the plan should contain a discussion of the scope and importance of the issue, alternative policies considered, the policy adopted by the local government for that issue, and a description of how the local policy will be implemented.

d. Within the policy discussion, local governments should address consistency between the plan and all adopted land use, public services, land use value taxation ordinances and policies, and capital improvement plans and budgets.

B. Zoning Ordinances.

Local governments shall review and revise their zoning ordinances, as necessary, to comply with § 10.1-2109 of the Act. The ordinances should:

1. Make provisions for the protection of the quality of state waters;

2. Incorporate either explicitly or by direct reference, the performance criteria in Part IV;

3. Be consistent with the comprehensive plan within Chesapeake Bay Preservation Areas.

C. Plan of development review.

Local governments shall make provisions as necessary to ensure that any development of land within Chesapeake Bay Preservation Areas must be accomplished through a plan of development procedure pursuant to § 15.1-491(h) of the Code of Virginia to ensure compliance with the Act and regulations. Any exemptions from those review requirements shall be established and administered in a manner that ensures compliance with these regulations.

D. Subdivision ordinances.

Local governments shall review and revise their subdivision ordinances, as necessary, to comply with § 10.1-2109 of the Act. The ordinances should:

1. Include language to ensure the integrity of Chesapeake Bay Preservation Areas;

2. Incorporate, either explicitly or by direct reference, the performance criteria of Part IV.

E. Water quality impact assessment.

A water quality impact assessment shall be required for any proposed development within the Resource Protection Area consistent with Part IV and for any other development in Chesapeake Bay Preservation Areas that may warrant such assessment because of the unique characteristics of the site or intensity of the proposed use or development.

1. The purpose of the water quality impact assessment is to identify the impacts of proposed development on water quality and lands in Resource Protection Areas and to determine specific measures for mitigation of those impacts. The specific content and procedures for the water quality impact assessment shall be established by local governments. Local governments should notify the board of all development requiring such assessment. Upon request, the board will provide review and comment on any water quality impact assessment within 90 days, in accordance with advisory state review requirements of § 10.1-2112 of the Act.

2. The assessment shall be of sufficient specificity to demonstrate compliance with the criteria of the local program.

F. Review by the board.

The board will review any proposed management program within 90 days. If it is consistent with the Act, the board will schedule a conference with the local government to determine what additional technical and financial assistance may be needed and available to accomplish the long term aspects of the local program. If the program or any part thereof is not consistent, the board will notify the local government in writing stating the reasons for a determination of inconsistency and recommending specific changes. Copies of the adopted program documents and subsequent changes thereto, shall be provided to the board.

§ 5.7. Certification of local program.

Upon request, the board will certify that a local program complies with the Act and regulations.

PART VI.
ENFORCEMENT

§ 6.1. Applicability.

The Act requires that the board ensure that local governments comply with the Act and regulations and that their comprehensive plans, zoning ordinances, and subdivision ordinances are in accordance with the Act. To satisfy these requirements, the board has adopted these regulations and will monitor each local government's compliance with the Act and regulations.

§ 6.2. Administrative proceedings.

§ 10.1-2103.8 of the Act provides that the board shall ensure that local government comprehensive plans, subdivision ordinances, and zoning ordinances are in accordance with the provisions of the Act, and that it shall determine such compliance in accordance with the provisions of the Administrative Process Act. When the board determines to decide such compliance, it will give the subject local government at least 15 days notice of its right to appear before the board at a time and place specified for the presentation of factual data, argument, and proof as provided by § 9-6.14:11. The board will provide a copy of its decision to the local government. If any deficiencies are found, the board will establish a schedule for the local government to come into compliance.

§ 6.3. Legal proceedings.

§ 10.1-2103.10 of the Act provides that the board shall take administrative and legal actions to ensure compliance by local governments with the provisions of the Act. Before taking legal action against a local government to ensure compliance, the board shall, unless it finds extraordinary circumstances, give the local government at least 15 days notice of the time and place at which it will decide whether or not to take legal action. If it finds extraordinary circumstances, the board may proceed directly to request the Attorney General to enforce compliance with the Act and regulations. Administrative actions will be taken pursuant to § 6.2.

DCS-721-89

WALLACE E. REED, CHAIRMAN
CHARLOTTESVILLE

TIMOTHY E. BARROW
VIRGINIA BEACH

SAM C. BROWN, JR
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WALLACE N. DAV
EXECUTIVE DIRECTC

August 16, 1989

Mr. Charles H. Ellis, III
Senior Environmental Programs Analyst
Council on the Environment
903 Ninth Street Office Building
Richmond, VA 23219

Dear Mr. Ellis:

This is in response to your July 17 request to provide comments on Federal Project No. 754: Army Material Command Relocation to Fort Belvoir. New buildings, parking areas, roadways, utilities, and security berms are proposed.

This agency enforces the Regulations for the Control and Abatement of Air Pollution. Compliance with these regulations is designed to provide minimum air quality impacts. Specific rules which may apply to the air pollution impacts from your project are as follows:

Rule 5-1 regulates the minimization of fugitive dust from land clearing, excavation and construction and requires that adequate measures be taken to control fugitive dust. This means, as a minimum, the wetting down of earth disturbed in excavation and filling, and preventing the transport of fugitive dust from the construction site by covering loads in transit and washing down public roads used intensively by construction equipment.

Rule 4-40 prohibits the on-site open burning of vegetative debris from land clearing in this area.

Section 120-08-01 requires a permit from this agency to set up and operate a potentially pollution causing device such as a boiler, incinerator, process, rock crusher, concrete batching plant, or asphalt paving manufacturing plant, and requires that such units meet stringent mechanical standards for air pollution control.

Local assistance in meeting the air pollution control requirements is available from the regional office of this agency indicated below.

Sincerely,

William W. Erskine, P. E.
Senior Air Pollution Control Engineer

WWE/dh

cc: Director, Division of Computer Services
Director, Region VII
Springfield Towers--Suite 502
6320 Augusta Drive
Springfield, VA 22150

S. MASON CARBAUGH
COMMISSIONER

MARK D. TUBB
DIRECTOR

COMMONWEALTH of VIRGINIA

DEPARTMENT OF AGRICULTURE AND CONSUMER SERVICES
Policy Analysis and Development
P. O. Box 1163, Richmond, Virginia 23209

August 3, 1989

Mr. Charles H. Ellis, III
Senior Environmental Programs Analyst
Council on the Environment
903 Ninth Street Office Building
Richmond, Virginia 23219

RE: Scoping Notices from the Corps of Engineers for their Base Realignment and Closure, Fort Belvoir Development and Relocation of the Army Material Command

Dear Charlie:

Because we would ask the Corps to address the same issues in response to the Corps scoping notices for the captioned projects, we have consolidated our responses into this single response.

The following are the issues that we believe the Corps should address in its environmental impact statements, draft or otherwise:

1. Pesticides -- The Corps should determine whether the construction or the operation and maintenance or the demolition or the closure of any of the projects will require the application of pesticides. If so, the Corps should cause a usage plan to be formulated, designed to mitigate or eliminate adverse environmental impacts and threats to worker safety from such pesticide usage. Formulation of such a plan can be coordinated with the various services within by the US Department of Agriculture.

2. Change in Land Use -- All of the projects appear to contemplate use of land already owned by the federal government, but further development of the projects' designs may create a need to buy additional land to complete the projects. If the acquisition of additional land becomes necessary, several questions are raised. Does the Federal Farmland Protection

Policy Act apply to the actions to be taken? If so, have the requirements of that Act been satisfied? Will any of the projects create negative impacts on adjacent agricultural lands, if any, such as interference with cropping patterns or breeding operations? If so, what measures to mitigate such negative impacts can be taken?

3. Radon -- Could any construction activities result in the containment of radon? Will radon testing be performed?

We appreciate the opportunity to respond to the scoping notices. If you have any questions, please feel free to call me. Best wishes.

Sincerely,

Mark D. Tubbs

cc: S. Mason Carbaugh

COMMONWEALTH of VIRGINIA

Department of Historic Resources

221 Governor Street
Richmond, Virginia 23
Telephone (804) 786-3
TDD: 804-786-4276

MEMORANDUM

DATE: August 7, 1989 Reply To: 4261-FX

TO: Mr. Charles Ellis

FROM: Bruce J. Larson, Senior Review and Compliance Coordinator: Archeology
Elizabeth P. Hoge, Review and Compliance Officer: Architecture

PROJECT: Army Material Command Relocation to Fort Belvoir Scoping Notice

LOCATION: Fairfax County

****

XX Due to the archeological potential of this location, as well as the project impacts, a Phase 1 archeological field survey is necessary. This survey should locate all archeological resources which may be impacted by the project as it is presently planned. Please contact our office for a list of persons who have expressed an interest in doing contract archeological work in Virginia. A copy of the resulting report should be forwarded to the DHR for comment. All necessary archeological work must be completed, reviewed, and approved by this office prior to the commencement of any construction related activities.

XX The statewide survey of standing structures has not been completed. Because the project area has not been surveyed for standing structures and there is potential for properties that are listed or eligible for listing in the National Register, we recommend that a survey be done. Please contact our office to discuss the type of survey that should be done and to request information about contractors who are available to do surveys.

____ Additional information is required in order to complete the project's review:

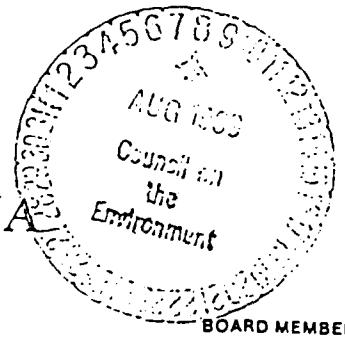
____ 35 mm, 3"X5", black and white, glossy prints of front and side elevations of all standing structures to be removed or impacted as a result of this project.

____ USGS map(s) showing project boundaries.

____ Plans and specifications.

COMMENTS:





COMMONWEALTH of VIRGINIA

STATE WATER CONTROL BOARD

2111 Hamilton Street

Richard N. Burton
Executive Director

Post Office Box 11143
Richmond, Virginia 23230-1143
(804) 367-0055

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August 7, 1989

Mr. Charles H. Ellis, III
Senior Analyst
Council on the Environment
903 9th Street Office Building
Richmond, Virginia 23219

RE: 1) AMC Relocation to Fort Belvoir
2) Base Realignment/Closure and Fort Belvoir Development

Dear Mr. Ellis:

In addition to the basic and usual EIS admixture, we request that the proposer address, to the extent that they are applicable, the elements contained in our recently updated guidelines supplemental to the State EIS Procedures Manual.

With the consideration of these elements, we believe that the ensuing EIS would represent a comprehensive inclusion of the varied aspects of our jurisdictional purview.

We look forward to the review of that document.

Sincerely,

C. E. Eaglick
Environmental Programs Analyst
Office of Water Resources Management

Attachment: SWCB Supplemental Guidelines

ed80/sph

VIRGINIA WATER CONTROL BOARD

SUPPLEMENTAL GUIDELINES

1. The location of the project relative to streams, lakes, waterways, etc., should be indicated on a USGS 7.5 minute topographic map. Any point of water withdrawal or wastewater discharge should be indicated on the map.

2. A description of all measures that will be utilized to control or prevent erosion and siltation into area streams should be provided. (Measures should meet guidelines promulgated in the Virginia Soil and Water Conservation Commission's Erosion and Sediment Control Handbook.

3. Information relative to sewage load to be generated by the facility, impact on existing sewage transmission and treatment facilities, and impacts of discharge (if on-site treatment facility) on State waters.

4. If hazardous chemicals, oils, or petroleum products will be handled at the facility, the EIS should explain what precaution will be taken to prevent spillage of these substances into Stat waters.

5. If use of pesticides or herbicides is contemplated in project area, details concerning application of these substances, precautions for handling, and their possible impacts on area streams (including toxicity or aquatic life) should be given.

6. Any possible impacts of the project on the quality, quantity, o distribution of groundwater should be stated.

7. EIS should specify the method of water supply to the facility and should mention whether the area water authority or water supply source can adequately meet project's projected water demand. Projected estimates of the future water demand by the proposed facility for at least a 20 year period should be provided.

8. Any water conservation measures that are to be incorporated in the design or operation of the proposed facility should be discussed and their effectiveness should be evaluated.

9. If the project involves either water withdrawals directly from free flowing streams or the construction of an impoundment, the data used to determine the hydrologic yield should be provided.

10. If the facility has an independent water supply, any measures t reduce water use during periods of drought should be discussed.

11. The time span for construction, especially construction in or near State waters, should be stated.

12. Alternatives should be discussed in as much detail as necessary for the proposed project, especially with regard to impacts on water quality and other aspects of the environment.

13. Methods of stormwater disposal should be detailed. If disposal is directly to area waters, all impacts on water quality should be propounded.

14. If the project entails dredging, filling, channelizing, construction of piers, bulkheads, etc., in State waters, a consideration of environmental impacts on the ecosystem in the affected waters should be given.

15. If the project involves a discharge of substances other than those discussed above to State waters, either surface or sub-surface, a definition of nature of discharge and its effects on State waters should be included in the EIS.

16. If the project involves water withdrawal and dam/reservoir construction, a discussion of the impacts on downstream water quality and ecosystem from the project site should be given.

17. Any possible impacts of the project on the quality or quantity of wetlands should be stated. The type of affected wetlands, as well as mitigative measures that will be utilized, should be listed. Locations of wetlands should be noted on the map.

18. The location of any threatened or endangered species of aquatic plants and animals should be provided.

19. If any of the waters are Scenic Rivers and/or Outstanding State Resource Waters, as described in VR680-21-07.2, a description should be provided of the specific designations and locations.

20. If the project involves reservoir construction, the volume, mean depth, mean annual flow of the major inflowing streams, and potential water quality of the waterbody (trophic state, annual total phosphorous loading, seasonal chlorophyll a levels, thermal stratification, and hypolimnion oxygen depletion) should be predicted.

ed42/sph

Northern Virginia Planning District Commission

7630 Little River Turnpike Suite 400 Annandale, Virginia 22003 (703) 642-0700

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(as of July 1, 1989)

August 18, 1989

Colonel Bernard E. Stalmann
District Engineer
U.S. Army Corps of Engineers,
Baltimore District
CENAB-PL-EA
P. O. Box 1715
Baltimore, MD 21203-1715

Attention: AMC EIS

Dear Colonel Stalmann:

I have received Public Notice PL-E-89-10 regarding the relocation of the Army Materials Command (AMC) headquarters to Fort Belvoir. It is my understanding that you are seeking input regarding issues that should be addressed in the Environmental Impact Statement (EIS).

Since the proposal is to construct a new facility, and will entail land disturbance and the alteration of existing site conditions, the EIS should:

- Document existing site conditions (e.g., land use, vegetative cover, etc.);
- Identify impacts on surface water and water resources;
- Identify wetland and flood plain encroachment;
- Document impacts on vegetation and wildlife (e.g., loss of habitat, impact to endangered species, etc.);
- Document potential loss of historic and archeological resources;
- Identify existing and potential erosion and sediment loss and document preventative measures;
- Determine soil suitability for the construction of the proposed facility;
- Document the effects of construction, facility operations, and additional traffic on air quality;
- Document mitigation activities.

Also, the Environmental Impact Statement should address any socioeconomic impacts associated with the facility relocation. In particular, the EIS should forecast effect of the proposed project on:

- Demographic character changes; and
- Changes in employment and income patterns.

The proposed facility will demand water supply resources and generate wastewater. Prior to the development of the proposed facility it should be determined and documented that there is adequate water supply and wastewater allocation to service the new Army Materials Command (AMC) facility. If adequate water and wastewater services are not available then any proposed actions to provide adequate services should be documented.

Also, the EIS should document if any hazardous materials will be transported to, stored at, or generated at the AMC facility. Proposed safety, storage, and/or disposal actions should be documented.

In addition to hazardous waste, the EIS should document the volume of solid waste that is expected to be generated at the AMC facility. Documentation should include the types of solid waste, including hazardous waste, that will be generated; the disposal practices that will be implemented; and impacts on disposal facilities.

The development of the proposed AMC facility will possibly create a substantial amount of impervious surface thus increasing stormwater runoff. The EIS should identify how much impervious surface will be created; how much additional stormwater runoff is expected; and what mitigation steps will be taken so that postdevelopment runoff does not exceed predominant runoff.

The EIS should address the issues of public safety. It should be documented whether or not there is adequate police, fire, and emergency medical services available to serve the 2,500 additional personnel to be relocated to Fort Belvoir. If the existing public safety services are not adequate then mitigation/modification actions should be documented.

Also, the new facility will redirect 2,500 employees to Fort Belvoir. The EIS should document if roads and other transportation services/infrastructure are adequately designed to accommodate the additional traffic. If not then mitigation/modification activities should be documented within the EIS report.

Finally, the Commonwealth of Virginia has passed Chesapeake Bay Protection Legislation and has developed Bay protection regulations as mandated by the legislation. The EIS should address the Bay protection regulations; identify whether not this facility is in compliance with the regulations and local programs; and any mitigation procedures that will be required and implemented.

If you have any questions I may be reached at 703-642-0400. Thank you for the opportunity to comment on the proposed (AMC) facility.

Sincerely

Beth Topol
Environmental Planner

BT/ls

metropolitan washington
COUNCIL OF GOVERNMENTS
1875 Eye Street, N.W., Suite 200, Washington, D.C. 20006-5454
(202) 223-6800 TDD 223-5980

August 9, 1989

U.S. Army Corps of Engineers
Baltimore District,
CENAB-PL-EA
P.O. Box 1715
Baltimore, MD 21203-1715

Attention: AMC EIS

Dear Sirs:

I am in receipt of Public Notice PL-E-89-10, Army Materiel/Command Headquarters at Fort Belvoir, Virginia, EIS At the present time I have no comments to offer, however, I would ask that I be kept informed of any future activities, reports, etc. which might pertain to this project.

Your assistance in this matter will be greatly appreciated.

Sincerely yours,

J. Shell, Jr.

James W. Shell, Jr.
Principal Water Resources Planner
Dept. of Environmental Programs

NATIONAL CAPITAL PLANNING COMMISSION

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IN REPLY REFER TO:
NCPC File No. MP20

AUG 23 1989

Colonel Bernard E. Stalmann
U.S. Army Corps of Engineers
[illegible]
CENAB-EN
P.O. Box 1715
Baltimore, MD 21203-1715

ATTN: Fort Belvoir/AMC EISs

Dear Colonel Stalmann:

The Commission appreciates the opportunity to participate in your scoping process on the two environmental impact statements (EIS) being prepared for Fort Belvoir. Since many of the Commission's concerns regarding long-term development of the post are common to both the proposal involving the Comprehensive Base Realignment/Closure and Fort Belvoir development and the actions related to relocating the Army Material Command Headquarters (AMC) to Fort Belvoir from leased space in the City of Alexandria, we have combined our comments on the two notices in this one response. In instances where we have specific comments applicable to one or the other of the proposed EISs, we have noted these specific concerns. In view of other proposed Federal actions in this same general area affecting the Humphreys Engineering Center, the Engineer Proving Ground and GSA's Franconia site, we have also included comments related to these sites as well.

According to the scoping sessions held on August 8th and 9th, the Army is proposing a net increase of about 7,500 employees at Fort Belvoir. We understand that these totals do not include the Humphreys Engineering Center, where the Headquarters of the U.S. Army Corps of Engineers with about 1,300 employees is proposed, or the Engineering Proving Ground, where about 3,000,000 square feet of office space is proposed to accommodate the approximately 10,000 Army employees now housed in leased space in the Region.

As a result of these changes, we understand the Army will prepare the following plans for submission to the Commission and regional referral for review and comment to affected local governments, sub-regional, regional and state agencies and organizations prior to Commission action thereon:

1. A revised Master Plan for Fort Belvoir (which will include the Humphreys Engineering Center but not the Engineer Proving Ground), and

2. A master plan (or its equivalent) for the Engineering Proving Ground which is proposed to be redeveloped for a major Army office center and a mixed use private development.

We also understand that GSA is to prepare a master plan for the redevelopment of the Franconia Storage Depot site into a major Federal office site.

The following comments address these three master plans, the related environmental documentation for all of these proposed Federal actions, the Comprehensive Plan for the National Capital and specific comments related to the two specific scoping meetings, as follows:

Master Plans

The Commission approved the current master plan for Fort Belvoir on May 5, 1983, including an employment level of 12,000 military and civilian employees. The proposed revised total of 22,500 employees would be an increase of 10,500 employees above the current master plan. This is a very significant increase.

The Commission staff recently informally reviewed an early draft of the revised Master Plan for the smaller Fort Belvoir. It showed a number of changes or pending projects that are inconsistent with the 1983 Commission approved plan. All of the post-1983 master plan changes should be included in the revised plan. The Army may want to consider combining the master plan report with the EISs, if possible, so that material in the environmental reports could be available during the early stages of the master plan review process. Commission procedures require that the National Environmental Policy Act (NEPA) process be completed before the Commission takes action on a master plan or project plan subject to the NEPA process. The timing of the Commission's action on the plans, therefore, will be dependent on the schedule for completion of the EISs.

It would be desirable for the Commission to review the Army's two master plans and GSA's Master Plan for the Franconia site at the same time. If this is not possible, we feel it is essential for the Commission to at least be able to review environmental documentation that assesses the cumulative impact of all Army plans as well as GSA's proposed master plan for a major Federal office

center at its Franconia site. This is also the only way the Commission would have an adequate basis for proposing related modifications to the Comprehensive Plan for the National Capital, as discussed below.

Environmental Documentation

Public Notice PL-E-89-9 indicates that "several independent, yet related, actions will be incorporated into a single EIS to allow for a cumulative analysis of the potential environmental, transportation, social and cultural impacts." This cumulative analysis will be included in the EIS on Base Realignment/Closure and Fort Belvoir Development and, according to the notice, include the following:

1. the results of the EIS for the Army Materiel Command;

2. the results of the Environmental Assessment for the Humphreys Engineering Center, including the proposed new headquarters for the Corps of Engineers;

3. information available during the preparation of the separate EIS for the development of 3 million square feet of Federal office space on part of the Engineer Proving Grounds; and

4. to the extent possible, the impacts of the proposed administrative office center at GSA's Franconia Depot.

In other words, the Army apparently intends to prepare three separate EIS's and one Environmental Assessment. GSA will presumably be preparing either an EIS or an Environmental Assessment on its proposed action. To the extent possible, it is the Army's stated intent to incorporate material from all five environmental analyses into the Fort Belvoir EIS so that all concerned can evaluate the cumulative impacts of all these Federal proposals.

It is not clear from the notice whether the schedules for all of the related environmental studies have been or can be coordinated sufficiently to permit this "tiered" approach to provide the necessary information prior to Commission actions on the three master plans and the related modifications to the Comprehensive Plan for the National Capital. The agendas for the scoping meetings indicate that the Final EIS's for the Army Material Command and the Base Realignment Closure and Fort Belvoir development would be completed by March 1990 and December 1990 respectively. We do not know what the schedules are for the Environmental Assessment for the Humphrey Engineering Center, the

EIS on the Engineer Proving Ground or GSA's environmental documentation on the Franconia site. In a meeting on August 16th, Colonel Hardiman indicated he felt they could all be coordinated in a timely manner.

The complete schedule for this "tiered" approach needs to be clarified in order to demonstrate that the necessary coordination will be achieved and the "cumulative analysis" will be complete for all three sites in time to serve as the basis for the necessary Commission actions.

Comprehensive Plan for the National Capital

The proposed increase in the number of employees at Fort Belvoir, the proposed redevelopment of the Engineering Proving Ground, the closure of Cameron Station, and the proposed redevelopment of GSA's Franconia Storage Depot will require several modifications to the Federal Employment and Federal Facilities elements of the Comprehensive Plan for the National Capital.

In the Federal Employment element, there is a designated "Belvoir Federal Area," as shown on Diagram #1 and on the table on page 11, "Planning Ranges Targeted for Year 2000 Employment Areas." As indicated on the table, the plan's targeted total employment in the "Belvoir Federal Area" for the year 2000 is between 11,000 and 11,300. This was based upon projected employment levels for the year 2000 in the master plans approved by the Commission at the time it adopted this element on March 3, 1983. If all of the current proposals were to be implemented by the year 2000, it would appear to result in an increase of between 26,000 and 33,000 Federal employees in the "Belvoir Federal Area," a very significant increase of almost threefold. The ultimate total number of proposed Federal employees in the "Belvoir Federal Area," according to the installation master plans, was 18,300, as shown on page 12 of the Federal Employment element. The more recent proposals would represent an increase of from 7,700 to 14,700 employees over these "ultimate" projections.

The Federal Facilities element contains Federal facility goals, location criteria and Federal planning and transportation policies. It also contains diagrams indicating the location of Federal lands in the National Capital Region and the predominate use of each such site. This element would also need to be modified as a result of the proposed actions, as follows:

1. deletion of Cameron Station as a Federally-owned site (unless some or all of this site should be retained for some other Federal use).

2. deletion of any portion of the Engineering Proving Ground site that may be conveyed to a private developer.

3. redesignation of GSA's Franconia site from "Special Service, Training and Support Facilities" to "Executive Branch Administrative Facilities."

All of these modifications to the Comprehensive Plan for the National Capital within the Belvoir Federal Area would need to be made by the Commission at the same time as, or prior to, the adoption of any of the master plans or revised master plans for any installation. In addition, these modifications need to be based on adequate environmental documentation of the cumulative impact of all the proposed actions by the Army and GSA. The Commission will, therefore, rely on the environmental documentation prepared by the Army and GSA as the basis for any proposed modifications to the Comprehensive Plan, as well as the approval of any proposed master or revised master plan.

As noted, it would appear that the proposed actions on these three Federal sites in the I-95 (Shirley Highway) corridor could result in the construction of from about 6 to 7 million square feet of office space that could accommodate from 26,000 to 33,000 additional Federal employees. See enclosed summary table. This significant increase raises questions about the appropriateness of these locations for major office centers of the proposed magnitude, their concentration in the same general area and whether all of these proposals can be accommodated without adverse environmental and transportation impacts on this part of Northern Virginia.

One of the Commission's policies in the Federal Employment element of the Comprehensive Plan for the National Capital is:

> "Federal employment locations outside the Central Employment Area should be directed, consistent with Federal agency needs and functions, toward employment centers as identified in the Comprehensive Plan particularly those well-served by public transit."

At the August 8, 1989 scoping meeting, you indicated that the Fort Belvoir Master Plan update will include a "Regional Transportation Plan" that will address the transportation needs of the proposed Federal actions at Fort Belvoir and at all of the other Federal sites in the larger area. Presumedly, this plan will establish how much additional activity and employment can actually be accommodated in this area, what additional transportation (highway and transit) facilities will be required, how these facilities will

be provided and what impact they would have on affected areas. We feel such a plan and program is an essential precondition for any Commission action to modify the Federal Employment and Federal Facilities elements of the Comprehensive Plan to conform these elements with the proposed plans and the increased employment levels.

The proposed development of two major Federal office centers in a generally low density suburban area with about 3 million square feet of space at the Engineering Proving Ground and up to 2 million square feet of space at GSA's Franconia site and the relocation of Cameron Station to Fort Belvoir will require adequate public transportation to serve the thousands of Federal employees involved. The Franconia site is located in close proximity to the proposed Springfield Metro Station, which, however, has not yet been constructed or funded. It would also be served by the proposed Springfield Bypass or Fairfax Parkway now under construction in this area.

The EPG site, however, is not on the planned Metrorail system; nor is there any official plan to provide such service in this area. We understand that the Army will study the possible extension of the Springfield Metro line to serve the EPG site. A station near the intersection of I-95 and Backlick Road to serve IPG as well as the Humphrey Engineering Center and Fort Belvoir would seem desirable. Such a line could ultimately be extended further south out into Prince William County where some of these new Federal employees will probably choose to live.

There are policies in the Comprehensive Plan that these proposals are consistent with including the use of existing Federal facilities to meet agency requirements and the consolidation of agency functions in common or adjacent space to improve administration, employee management and productivity. However, these proposals may raise questions of economic impact on affected local jurisdictions which should be addressed. A Commission policy in the Federal Employment element states:

> "Major new locations or relocations of Federal employment that will occupy 100,000 square feet or more of building space in the Region should be planned and programmed (timed), to the maximum extent practicable, to minimize adverse economic impacts on affected local jurisdictions."

Your consolidated environment documentation should specifically address this issue and describe the economic impacts from these proposed Federal actions on all of the affected jurisdictions in

Northern Virginia, as well as the District of Columbia and Maryland.

Another policy in the Federal Employment element is that:

> "The historic relative distribution of Federal employment approximately 60 percent in the District of Columbia, the established seat of national government, and 40 percent elsewhere in the Region should continue during the next two decades."

The Army and the GSA should address the impact of their proposals on the geographic distribution of Federal employment in the National Capital Region and the extent to which the cumulative impact of these proposals may impact this 60/40 geographic distribution.

Detailed Scoping Comments

There are several areas of potential environmental and planning concern that we would like to bring to your attention as part of the scoping process.

1. Transportation

Traffic congestion of roadways in the area of Fort Belvoir is a very important issue. The traffic analysis in the Environmental Reports should, to the extent possible, account for all reasonably foreseeable development (public and private) in the area, assess the impact of this combined growth on existing and planned road systems, and outline in specific terms the improvements and transportation system management measures to be implemented by the Army to minimize or reduce expected adverse effects due to its actions. Extension of public transit should be studied as a way of limiting new vehicular trips. Air quality impacts related to the increased traffic on the local roads should be given careful review as well.

2. Environmentally Sensitive Areas

A large portion of Fort Belvoir contains environmentally sensitive areas including wetlands, floodplains, wildlife habitat areas, and forested lands. The 1983 approved master plan delineates these areas in general, and the Post is to be commended for its past efforts to protect environmental resources. Planned growth associated with

the proposed actions could threaten these areas. We recommend that a thorough analysis of these features be undertaken as part of the environmental review and the master plan. To the extent possible, the precise boundaries of these areas should be delineated. Development that could adversely effect the integrity of these areas should be avoided. Compensation for any loss of wetland areas should be provided.

3. Extent of Impervious Surfaces

The new proposals under consideration for Fort Belvoir could result in a substantial increase in paved surfaces on the post. For example, the planned parking for the AMC facility alone could require paving over 14 acres of land area. Because Commission policy encourages agencies to limit the amount of impervious surfaces on their sites in order to preserve existing green areas and to reduce adverse stormwater runoff-related effects, we suggest that the documents explore alternatives to providing extensive paved surface parking areas. Further, possible measures for maintaining post-development stormwater runoff levels to pre-development conditions should be evaluated and included in the EISs and the master plan.

4. Socio-economic Impact

The socio-economic impact of moving large numbers of Federal employees from one jurisdiction to another should be evaluated in the two documents. Adverse impacts on the affected jurisdictions and employees should be minimized.

We hope these comments will be of assistance to you as you begin the NEPA process and the related master planning work. If you have any questions regarding our comments, please contact Ronald E. Wilson of my staff on 724-0191.

Sincerely,

Reginald W. Griffith

Reginald W. Griffith
Executive Director

Enclosure

cc: Col. Hardiman
Walt Freeman, DOD
Ira Wagreich, Fort Belvoir
Linda Eastman, GSA

ESTIMATED FEDERAL EMPLOYMENT AND SPACE INCREASES IN THE BELVOIR FEDERAL AREA

	Site	Projected Employment Change	Est. Square Feet
1.	Revised Master Plan for Fort Belvoir (including Humphreys Engineering Center)	+ 8,800	+ 1,760,000
	a. Army Material Command (maximum of 2,500)		
	b. Base Closure and MCA (maximum of 5,000)		
	c. Headquarters, Corps of Engineers (1,300)		
2.	Master Plan for the Engineering Proving Ground (Army office center only)**	10,000	+ 3,000,000*
3.	Master Plan for GSA's Franconia Depot Storage Site (Proposed major Federal office center	7,000 to 14,000	1,200,000 to 2,400,000 Sq. ft.
	Totals	25,800 to 32,800 Employees	5,960,000 to 7,160,000 Sq. ft.

* Estimate assuming 200 gross square feet per employee.

** Formerly part of Fort Belvoir's Master Plan.

*** 10,000 Army employees are currently housed in leased space. Total does not include any possible private office development.

**** Estimate of 1,000,000 to 2,000,000 occupiable square feet inflated by 20% to be comparable to Army square foot estimates.

COMMONWEALTH OF VIRGINIA
COUNTY OF FAIRFAX
BOARD OF SUPERVISORS
FAIRFAX, VIRGINIA 22030

GERRY HYLAND
BOARD OF SUPERVISORS
MOUNT VERNON DISTRICT
2511 PARKER'S LANE
ALEXANDRIA, VA 22306

TELEPHONE: 780-7518

August 21, 1989

U. S. Corps of Engineers, Baltimore District
Attention: CENAB-PL-ES
Fort Belvoir EIS Comments
P. O. Box 1715
Baltimore, MD 21203

Gentlemen:

Thank you for this opportunity to comment on the scoping of Fort Belvoir's comprehensive base realignment/closure and Fort Belvoir's development environmental impact statement. I would like to take this time to briefly mention a few of my concerns and request they be incoporated into the EIS deliberations.

1. The time table of the four Environmental Impact Statements is troublesome.

AMC is due April, 1990
GSA is due sometime in 1990
The Comprehensive realignment is due in February 1991
The EPG is due in the Spring of 1991

The comprehensive realignment EIS, seems to me, should be completed prior to the AMC and the GSA statements because it encompasses the AMC and the GSA sites. The comprehensive realignment is the most encompassing statement and yet it is due out after the AMC and the GSA statements. It is my understanding that when each of the impact statements are completed and satisfied, construction would be allowed to begin. I do realize, however, that the federal government is ending many of its lease agreements with the private sector and that there is a great deal of pressure to move forward with the base realignment before those agreements terminate. I would just like to be enlightened as to the scheduling of these environmental impact statements.

2. During this environmental impact statement process, I would like to suggest that, although certainly not required, it would be to the benefit of all that your office work very closely with the citizenry who will be impacted by the development at Fort Belvoir. I have found by bringing the public into the process it negates a lot of misunderstanding and even builds consensus.

3. I would also suggest to you that the impacts of the Fort's growth and development to Fairfax County's and the State of Virginia's infrastructure will be considerable. With that in mind I would strongly suggest that your office work closely with the Virginia Department of Transportation's Northern Virginia 2010 Transportation Planning Committee and the Northern Virginia Planning District Commission.

4. I also believe it would very advantageous to work with Fairfax County's Deputy Director for Human Services, Mr. Verdie Haywood to discuss a vital need for providing affordable housing for some of the population which the Fort's development will bring into the County.

5. I realize the Fort will be increasing the size of its hazardous waste depot. As you know, on behalf of my constituents in the Mt. Vernon District, I cannot support this facility and strongly recommend that this facility be located elsewhere, not on the Fort.

6. Under the direction of General Foote, Fort Belvoir has been a leader in both tree preservation and making sure that environmental wildlife corridors continue to exist throughout the land. During the development of the Fort, I would strongly suggest that General Foote's guidelines continue to be respected and that they become incorporated into the Fort's new master plan.

7. Lastly, and perhaps the most difficult of all issues to address is the one dealing with the tax benefits this development will have on Fairfax County. In other words, what will be the net tax benefits to the County?

Again thank you for this opportunity. Please know I am very willing to work closely with you on this major development of Fort Belvoir.

Sincerely,

Gerry Hyland

0439H

FAIRFAX COUNTY PUBLIC SCHOOLS

Department of Facilities Services
10700 Page Avenue
Fairfax, Virginia 22030

October 5, 1989

Carl B. Barnes, Jr., LTC, Aviation
Acting District Engineer
Baltimore District, Corps of Engineers
CENAB-PL-ES
P.O. Box 1715
Baltimore, Maryland 21203-1715

Dear Colonel Barnes:

Fairfax County Public Schools received Public Notice PL-E89-16 regarding the Base Realignment/Closure and Fort Belvoir Development EIS. Development plans involving Fort Belvoir will impact on school facilities requirements. Consequently, I am requesting that you keep us informed of events pertaining to the EIS study. A representative from our office will attend the scoping meeting on October 16, 1989.

Further information concerning the study (i.e., meetings, draft reports) should be directed to Jeanne Yang, Office of Facilities Planning Services, Fairfax County Public Schools, 10700 Page Avenue, Fairfax, Virginia 22030.

Sincerely,

Gary D. Chevalier, Coordinator
Facilities Planning Services

GDS/ms

Reference: CENAB-PL-ES (200)

November 5, 1989
238 South Jenkins Street
Alexandria, Virginia 22304

Subject: Comprehensive Base Realignment/Closure and Fort Belvoir Development Environmental Impact Statement

United States Corps of Engineers, Baltimore District
Attention: CENAB-PL-ES
Fort Belvoir EIS Comments
Post Office Box 1715
Baltimore, MD 21203

Dear Sirs:

This letter addresses the potential reuse of Cameron Station as cited in the last sentence of the next to the last paragraph of page two of Public Notice PL-E-89-16. I spoke briefly at the Scoping Meeting on 16 October 1989 at the Patrick Henry Elementary School in Alexandria, Virginia. From the "Screening" graphic presented that evening there was an option of alternatives and choices.

My interest in these matters stems from the location of my residence. Cameron Station previously was immediately across my back fence, but the Military District of Washington transferred several acres of land to the City of Alexandria for inclusion in the Holmes Run/Tarleton Park. This is tangible evidence of the continuing good neighbor policy on the part of the Army.

This residence is the nearest one to the confluence of Holmes Run and Backlick Run, where the stream becomes Cameron Run. In this location it was one of the first in the neighborhood to be flooded when the gates at Lake Barcroft were manually operated to dump a large amount of water in a brief duration during the by then tropical storm Eloise in 1975. Much of Cameron Station was also flooded at that time. The City of Alexandria hastened the completion of flood control measures downstream at two railroad bridges across Cameron Run and did not wait for the Army Corps of Engineers to exercise its new charter covering all "navigable" streams.

This neighborhood and Cameron Station were also flooded during the by then tropical storm Agnes in 1972 when the southern abutment of the dam at Lake Barcroft eroded and drained the lake. This was prior to the very extensive survey by the Army Corps of Engineers on the threat to the public by privately owned impoundments.

In 1966, prior to my moving to this location, this neighborhood and Cameron Station were flooded by a nameless rainstorm. Some automobiles on the Cameron Station parking lot did not have time to sink in place, but floated to duck pond before sinking.

Near the beginning of World War II the survey stakes for a new Quarter Master Depot on the right bank of the Boundary Channel were pulled up to make way for some new thing called a "pentagon". The setting of survey stakes at a new site was postponed because of flooding at the new site, Cameron Station.

In spite of much of Cameron Station being in the flood plain, the land value is quoted as almost $ 1 million per acre. However, high property value is not sufficient reason for selling. The City of New York has not sold Central Park to the highest bidder, in spite of financial difficulties. The valuable land of the National Institutes of Health "Reservation" in the area bounded by Old Georgetown Road, Cedar Lane, Rockville Pike, and Battery Lane does not have a "for sale" sign. Some things are too valuable to put on the auction block.

As a Senator, John F. Kennedy introduced legislation to extract the Army Medical Library from the Army. This eventually became the prestigious National Library of Medicine and is located on the above mentioned "Reservation".

Senator Eggleton from Missouri introduced legislation to rescue the National Archives from the General Services Administration.

Both sets of legislation should be emulated to transfer the holdings of the former Armed Services Technical Information Agency to be under the administration of the National Archives, to be renamed the National Library of the Physical Sciences and Technology, and to be located above the flood plain at Cameron Station.

Sincerely,

Ronald R. Holder

Baker Engineers

October 20, 1989

U.S. Army Corps of Engineers
Baltimore District
CENAB-PL-ES
P.O. Box 1715
Baltimore, MD 21203-1715

Attn: Ft. Belvoir EIS

Gentlemen:

We would appreciate copies of the information presented at the scoping meetings for the Fort Belvoir Environmental Impact Statement. We understand the deadline for written comments is November 6, 1989.

Please send the information to:

Miles A. Carlson, P.E.
Baker & Associates
1420 King Street
Alexandria, VA 22314

Your assistance is appreciated.

Sincerely,
BAKER AND ASSOCIATES

Harrell W. Little
Architectural Manager

Baker and Associates 1420 King Street - Sixth Floor Alexandria, Virginia 22314-2787 (703) 838-0400

Appendix B

Biological Assessment of Threatened and Endangered Species

DRAFT

Biological Assessment of Threatened and Endangered Species (BATES)

Fort Belvoir
Cameron Station
Fort Myer, Virginia

July 1990

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BIOLOGICAL ASSESSMENT OF THREATENED AND ENDANGERED SPECIES FORT BELVOIR, CAMERON STATION AND FORT MYER, VIRGINIA

This Biological Assessment of Threatened and Endangered Species (BATES) has been prepared as part of the Section 7 consultation process with the U.S. Fish and Wildlife Service for the Comprehensive Base Realignment/Closure and Fort Belvoir Development Environmental Impact Statement (EIS) that addresses the impacts related to activities at Fort Belvoir, Cameron Station and Fort Myer.

This BATES is organized into eight (8) sections and four (4) appendices. Section 1 describes the proposed action. General descriptions of each of the impacted installations are presented in Section 2. Sections 3 outlines the methodology utilized in conducting the survey, including agency coordination. The results of this survey and other independent surveys completed either for site specific projects, or for general inventory and management purposes, are discussed in Section 4. Section 5 outlines the potential impacts to rare, threatened and endangered species located on each of the installations if the activities described in the proposed action are implemented. In addition, Section 5 also discusses mitigation options for those actions having the potential to impact rare, threatened and endangered species. Alternatives to the proposed actions are described in Section 6 and the conclusions are outlined in Section 7. Section 8 is a listing of references. The four appendices include: agency coordination documentation (Appendix 1); potential rare, threatened and endangered species for each of the installations (Appendix 2); Species lists compiled for each installation and installation subarea during the survey period (Appendix 3); and species and areas on Fort Belvoir for which additional surveys are recommended prior to development (Appendix 4).

1.0 DESCRIPTION OF THE PROPOSED ACTIONS

The proposed actions are the complete closure of Cameron Station, as established by Public Law, 100-526, Defense Authorization Amendments and Base Closure and Realignment Act of 1988. Activities associated with this act are known as BRAC activities. Approximately 3900 personnel from Cameron Station will be realigned to Fort Belvoir. Also approximately 200 personnel, also from Cameron Station, will be realigned to Fort Myer; and two people from Cameron Station will be realigned to Fort McNair. Approximately 60 personnel from Fort George G. Meade, 70 personnel from Fort Holabird and 190 personnel from the Army Materiel Technology Laboratory, Fort Devens, Massachusetts, will be realigned to Fort Belvoir. In addition to the actions outlined as part of BRAC, Fort Belvoir is updating its Master Plan. A variety of planning actions are identified in the new Master Plan in addition to BRAC activities. These actions are listed in Table 1. Therefore, the EIS and this BATES will not only examine the impacts of the BRAC actions, but will also briefly summarize those other activities relating to actions currently being considered by the Office of Master Planning.

Table . Proposed Base Realignment and Closure & Development Plan Actions at Fort Belvoir

Base Realignment and Closure (BRAC) Actions

1. Headquarters Complex
2. Industrial Facilities
3. Office Park Road
4. North Post Commissary Warehouse Addition
5. Post Exchange
6. Commissary
7. Administration Facility
8. Advanced Materials Laboratory
9. Branch Exchange (Convenience/Gas)
10. Modify Buildings 1466 and 1445 for Base Closure

Development Plan Actions

Military Construction Activity (MCA)

1. Child Development and Religious Education Centers
2. Electronics Supply and Maintenance Facility
3. DC Army National Guard Armory
4. DC Army National Guard Aircraft Parking Apron
5. Convert Buildings 206 and 208 to Classrooms
6. Veterinary Clinic
7. Operations Bldg Renovation, Engineer School Backfill
8. Telephone Switch upgrade, Post-wide
9. Fixed Wing Runway Extension
10. Old Guard Horse Stables
11. Main Sewer Line Upgrade, Post-wide
12. North Post Fire Station
13. Headquarters, Air Force Intelligence Agency
14. Physical Fitness Center
15. Va. Army National Guard Armory/Headquarters (29th LID)
16. Gunston Road Extension
17. DC Army National Guard Hangar Addition
18. Sea Bee Operational Storage Facility
19. Renovate Heat Plant
20. Renovate Building 361 for ADP
21. DC Army National Guard Academy
22. Electrical Upgrade, Post-wide, Phase I
23. Lateral Sewer Line Repair, Post-wide
24. Relocate EPG Test/Storage Facilities
25. Ammunition Storage Facility
26. Information Systems Facility
27. CIDC Field Operations Building
28. DC Army National Guard Cantonment Area
29. Main Post Library
(30. *there is no MCA 30)*
31. Loop Road

(Development Plan: MCA, continued)

32. Community Center/Welcome Center
33. Facility Engineer Maintenance Shop
34. Warehouses
35. Tactical Energy Systems Lab
36. Conforming Storage Building (DRMO)
37. Military Police Station
38. Reserve Center/OMA (80th Div)
39. Consolidated Maintenance Shop (DOL)
40. Electro-Optics Laboratory
41. Fatigue Test Facility
42. Potential 500-person Administrative Facility, HEC

Non-Appropriated Funds (NAF)

1. Youth Center
2. Tompkins Basin Recreation Area
3. Horse Stables
4. Benyuard Pool Addition
5. Golf Course
6. Corporate Fitness Center
7. Child Development Center
8. Temporary Lodging Facility

Army and Air Force Exchange Services (AAFES)

1. Fast Food Facility (Burger King)
2. Fast Food Facility (Chicken)
3. Car Care Facility

Army Family Housing (AFH)

1. Lewis Heights Renewal, Phase 1
2. Lewis Heights Renewal, Phase 2
3. 1,500 NCO Housing Units (New)
4. Dogue Creek Village Whole House Renewal
5. George Washington Village Whole House Renewal
6. River Village Whole House Renewal
7. Belvoir Village Whole House Renewal
8. Gerber Village Whole House Renewal
9. Visiting Officers Quarters Renovation
10. Jadwin Loop Whole House Renewal
11. Colyer Village Whole House Renewal
12. Rossell Loop Whole House Renewal
13. Woodlawn Village Whole House Renewal
14. Fairfax Village Whole House Renewal

The reuse plan for Cameron Station has not been finalized. Studies recently completed by the Baltimore District, U.S. Army Corps of Engineers, and the City of Alexandria indicate that the highest and best use for Cameron Station parcel is a moderately intense mixed-use area. The area would be predominantly residential with supporting retail and office complexes. Approximately 30 percent of the parcel would remain as open space for both passive and active recreation. A task force has been organized to address reuse at Cameron Station. Reuse plans will evolve over the next several months, but most are expected to be very similar to the highest and best use studies and all are likely to involve similar potential environmental impacts. At this time the BATES will address potential impacts which may occur at Cameron Station under the Baltimore District's highest and best reuse scenario.

2.0 SITE DESCRIPTION

2.1 Fort Belvoir

Fort Belvoir is located in Fairfax County, Virginia on the Potomac Peninsula, 11 miles southwest of the City of Alexandria and 18 miles southwest of Washington, DC (Figures 1 and 2). Fort Belvoir is comprised of a main post with approximately 9000 acres; Humphreys Engineer Center (HEC), approximately 600 acre facility on the northeastern corner of Fort Belvoir, owned by the U.S. Army Corps of Engineers; and an additional 800 acres in an area to the north, known as the Engineering Proving Grounds (EPG). A separate EIS is being prepared for EPG, it will not be included in this BATES. The main post of Fort Belvoir includes training areas, administrative areas, housing, community facilities, Davison Airfield, DeWitt Hospital, two wildlife refuges, and an active sanitary landfill (U.S. Army, 1989, U.S. Army, 1982). Approximately one-half of the post has been developed for the various uses outlined above (Waas, 1983). Of the remaining acreage, between one-third and one-half may be classified as wetlands (i.e. palustrine forested, palustrine emergent/scrub-shrub) (U.S. DOI, 1977; USDA, 1982). The majority of these wetlands are associated with Accotink, Pohick and Dogue Creeks as well as the Potomac River, Gunston Cove and Accotink and Pohick Bays. The remaining areas are upland forested tracts composed primarily of red oak (*Quercus rubra*) and white oak (*Quercus alba*), American beech (*Fagus grandifolia*), tulip poplar (*Liriodendron tulipifera*), pignut hickory (*Carya glabra*), and Virginia pine (*Pinus virginiana*) (Waas, 1983).

2.2 Cameron Station

Cameron Station consists of approximately 164 acres within the City of Alexandria, Virginia (Figures 1 and 3). The BRAC activities include excessing the entire Cameron Station parcel. The station consists of warehouses and administrative space, with a landscaped park area and two ponds which are referred to as Cameron Lake. Vegetative cover is sparse, consisting primarily of lawns and ornamental plantings around the buildings. The area around Cameron Lake has been planted extensively with weeping willows (*Salix babylonica*). Remaining native vegetation in the vicinity of the lake includes several oak species, sweet gum (*Liquidambar styraciflua*), tulip poplar, flowering dogwood (*Cornus florida*), flowering cherry (*Prunus serotina*), and red maple (*Acer rubrum*). Another small area in the western portion of the base contains

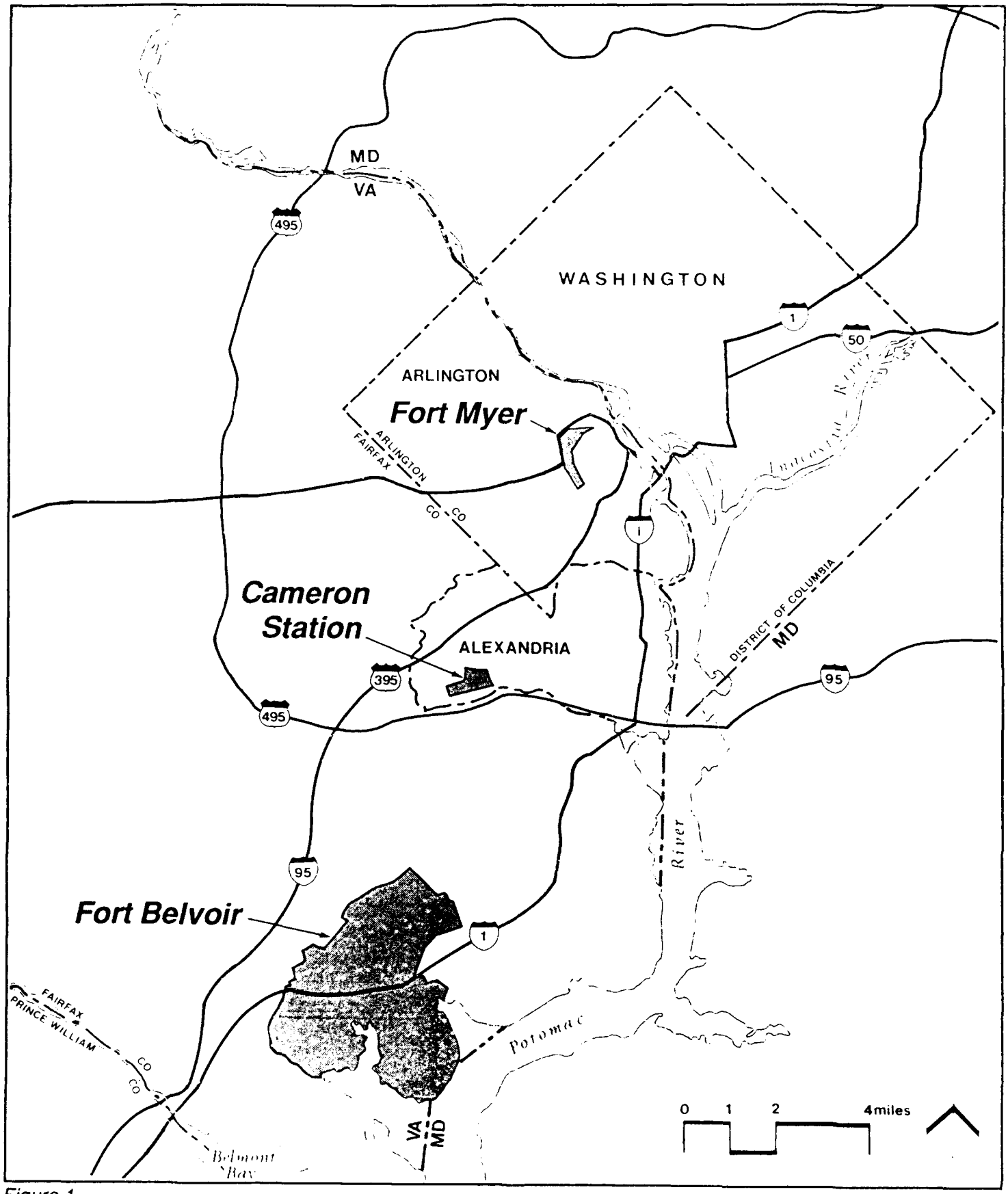


Figure 1

Project Area

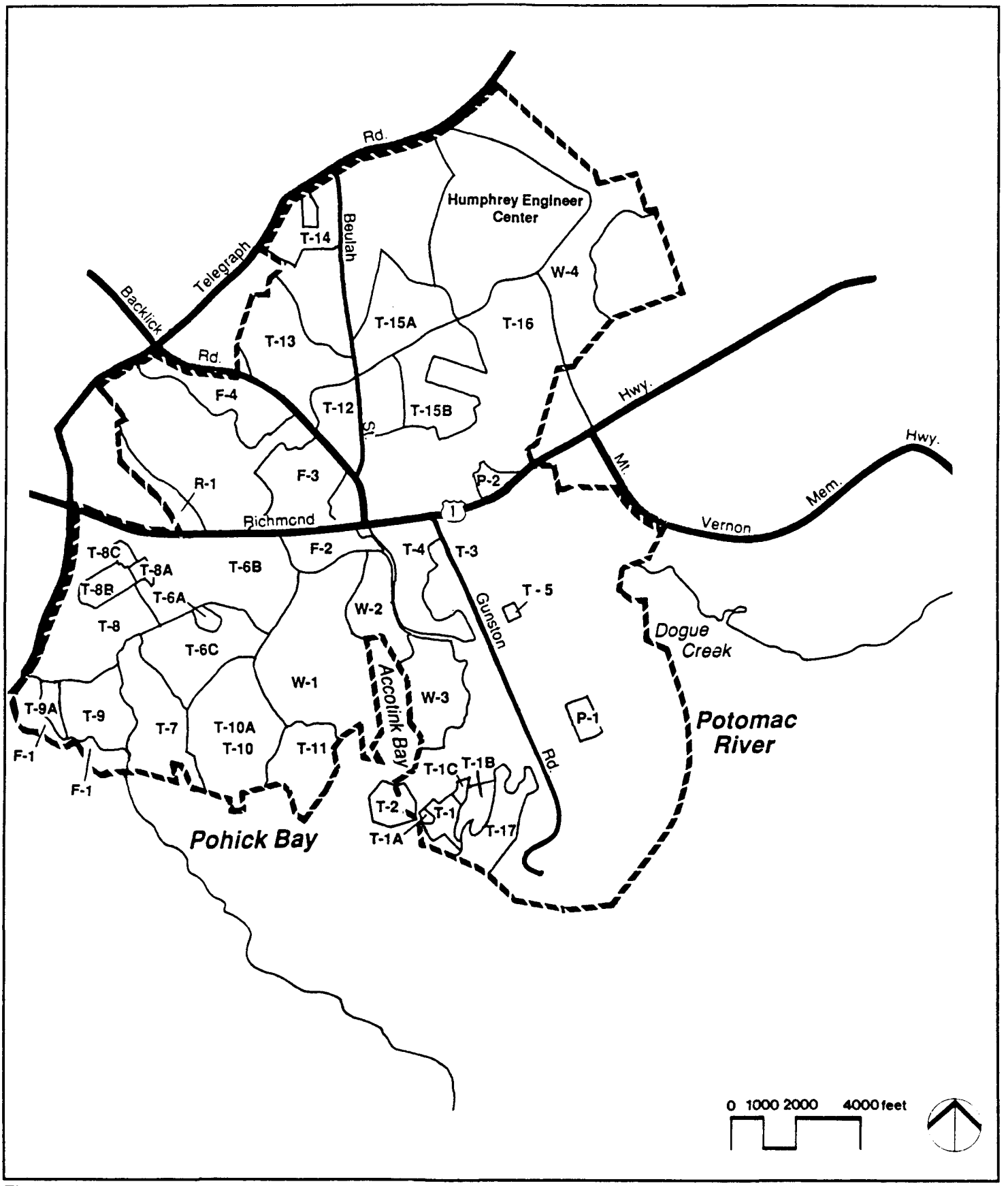


Figure 2

Fort Belvoir

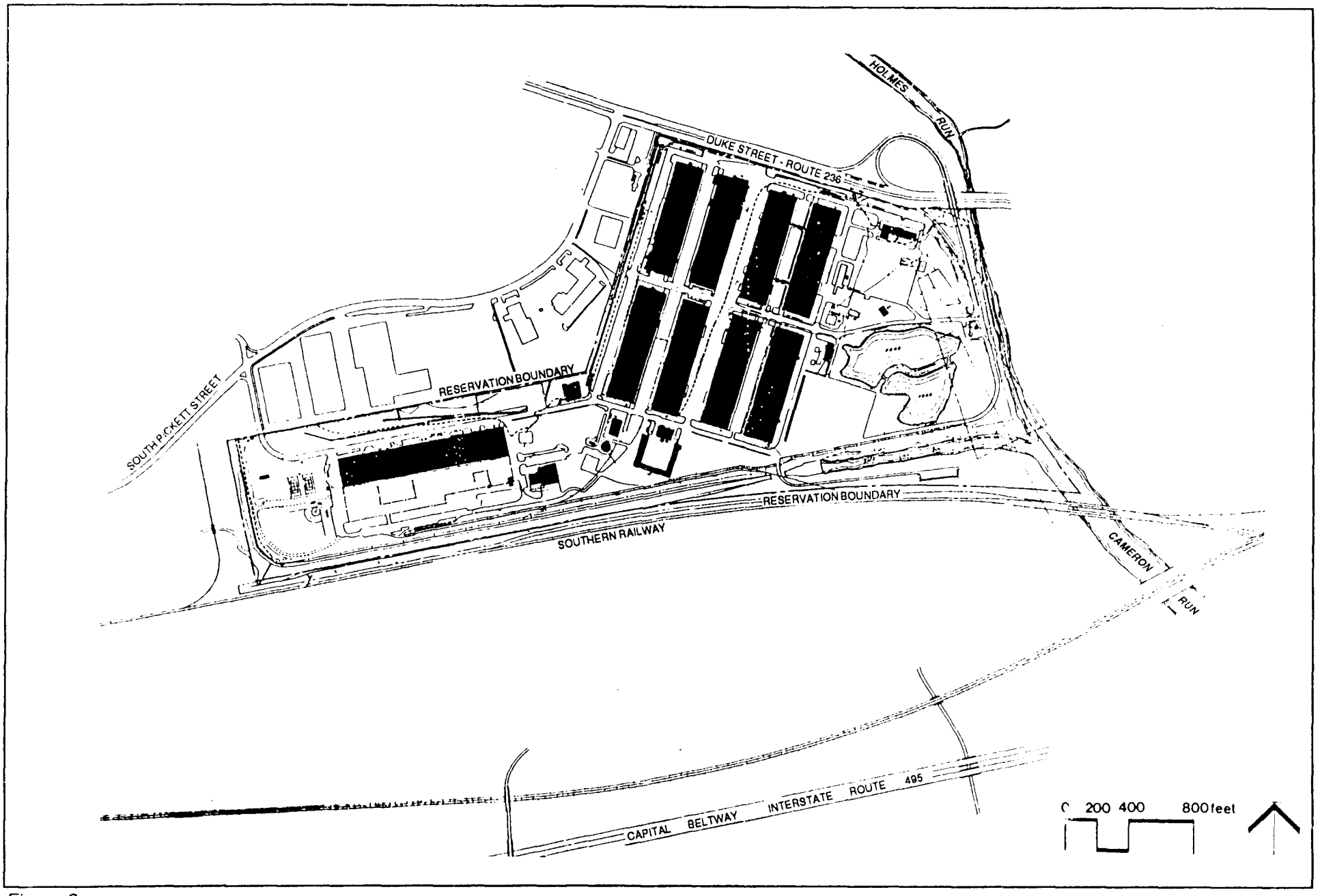


Figure 3

Cameron Station

similar tree species as well. Back Lick Run is a small stream on the southern boundary of the station. It is a tributary of Cameron Run and has undergone significant modifications due to channelization.

2.3 Fort Myer

Fort Myer is approximately 364 acres and is situated adjacent to Arlington National Cemetery (Figures 1 and 4). As part of the BRAC activities, approximately 200 personnel will be transferred from Cameron Station to Fort Myer. Fort Myer consists of several administrative buildings, housing for military personnel, as well as warehouse, equipment storage and repair areas. In addition, many ancillary facilities are located at Fort Myer, including a post exchange, two chapels, a health clinic and several ball fields and parks. Fort Myer is also the current home and stables of the Old Guard Unit used for ceremonial purposes. The majority of the acreage at Fort Myer has been developed. One large picnic area, near the boundary with Arlington National Cemetery, remains uncleared. This area, however, is mowed. The remaining areas on Fort Myer are landscaped lawns and parks.

3.0 METHODOLOGY

Prior to performing the site reconnaissance, existing information was requested from both the Virginia Natural Heritage Program and the Biota of Virginia Office (BOVA) of the Virginia Department of Game and Inland Fisheries. This data was reviewed to determine if any rare, threatened or endangered species have been documented on any of the three installations (Fort Belvoir, Cameron Station and Fort Myer) covered under the scope of this BATES and its corresponding EIS. It should be noted that for the purposes of this BATES, all candidate species have been included within the categories they have been nominated for, based on the most current information available. The full text of information provided by these two agencies, which also includes some species not categorized as rare, threatened or endangered, is included in Appendix 1. A summary of potentially rare, threatened and endangered species, by installation, is provided in Appendix 2.

In Appendix 2 all known species designation codes are listed under three headings: State Rank, Federal Status, and State Status. State Rank is the designation assigned to a species by the Virginia Natural Heritage Program. It is an index of biological rarity for a species within the state. While these designations do not carry corresponding legal designations in all cases, many of the species with high rankings have been proposed for legal status and are monitored by the Virginia Heritage Program. Federal Status is the legal status assigned to a species by the U.S. Fish and Wildlife Service, Division of Endangered Species and Habitat Conservation. All species formally listed as endangered or threatened are protected under the Endangered Species Act of 1973 as amended. Candidate species are species whose status is under review to determine eligibility for threatened or endangered status. State status designations, for the most part, conform to the Federal status designations, and as such are legal definitions supported by Virginia's Endangered Species Act. The

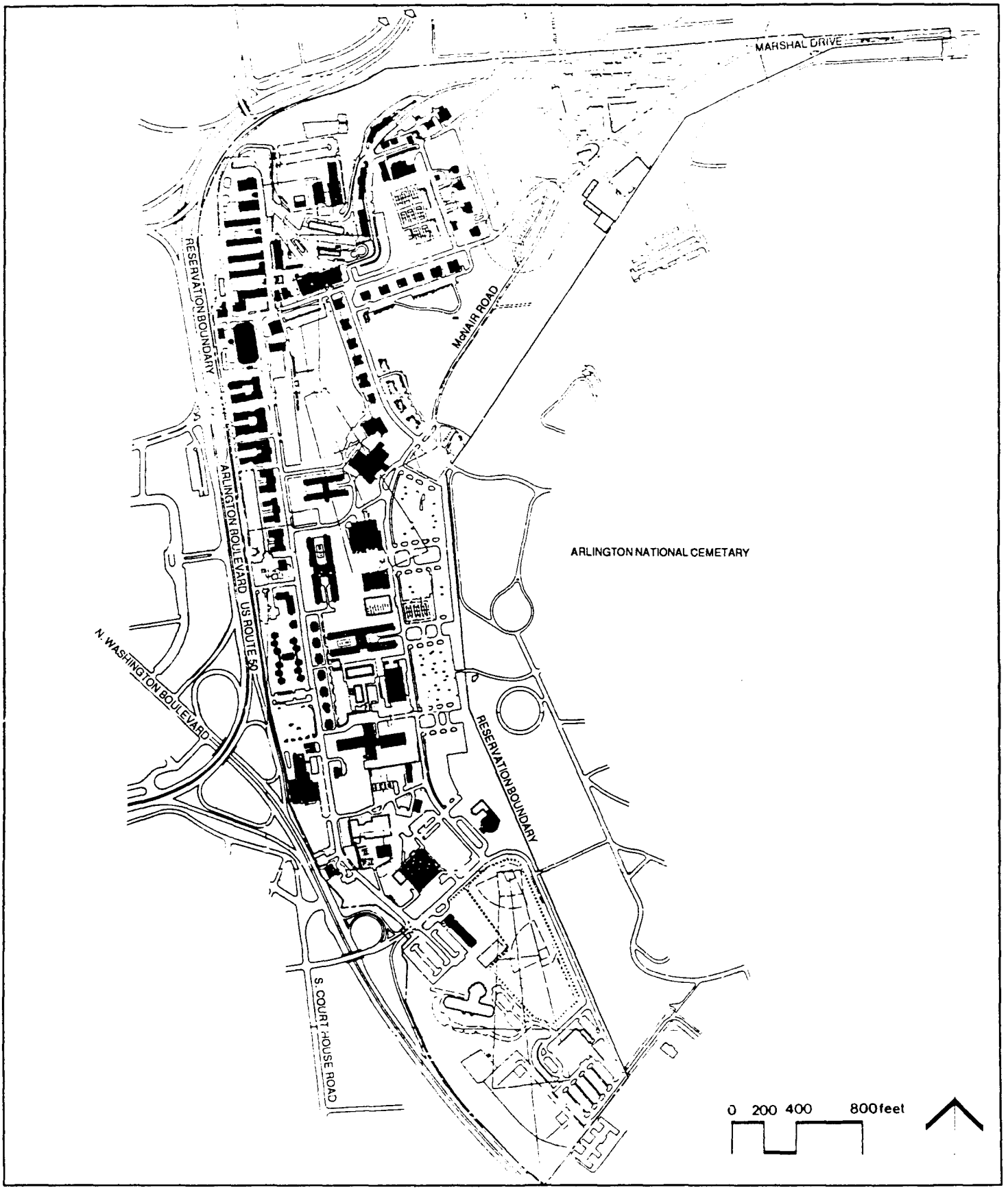


Figure 4

Fort Myer

exceptions to this are all status designations prefixed by the letter R (Virginia Natural Heritage Program, 1990). These designations reflect the findings of the 1989 Virginia Endangered Species Symposium and are used to determine which species should be recommended for listing as threatened or endangered, and which species need to be closely monitored for potential future listing.

In addition, the Virginia Heritage Program's element list for Virginia was reviewed and cross-referenced with the Atlas of the Virginia Flora, 2nd edition, to determine additional rare plant species which could be found on any of the installations based on preliminary habitat information and documented range. The resulting list can be found in Appendix 2 of this BATES. Studies being conducted by George Mason University were also reviewed to determine locations of additional species. Information on rare, threatened and endangered species included in other documents (environmental assessments, rare plant surveys, etc.) provided by the installations was also incorporated into a master species list for each installation (Appendix 2, location column). Personal interviews were then conducted with Scott Belfit, Environmental Specialist, Fort Belvoir; Dr. Carl Ernst, Department of Biology, George Mason University; Dr. John Holsinger, Department of Biology, Old Dominion University; Dr. Robert Jenkins, Roanoke College; Chris Pague and Chris Ludwig, Virginia Natural Heritage Program, to further refine the list for each installation.

A site reconnaissance was conducted during March 1990 at Fort Belvoir, Fort Myer and Cameron Station. The primary objective of the site visit was to look for preferred habitat for those species whose range may extend into the three installations being evaluated. The presence of those protected species was also evaluated. At Fort Belvoir, the survey included visits to each of the sites proposed for BRAC and Master Planning actions. In addition, observations were made in each of the management areas designated in Figure 2. Since Fort Myer and Cameron Station are both much smaller in size than Fort Belvoir, as well as more heavily developed, it was easier to evaluate a higher percentage of the habitat on these two installations. The survey at Fort Myer focused on the site proposed for BRAC actions and the few undisturbed areas on the post. All of Cameron Station was surveyed as this post will be closed under BRAC.

For each of the surveys, all species (including those not listed as rare, threatened or endangered) encountered, were recorded for each area visited (Appendix 3). Some areas were recommended for additional surveys if they exhibited potential habitat for a rare, threatened or endangered species which were not visible due to the seasonal timing of the field survey in March. The time when most of the plants and animals on the list would be more readily observed is between May and July.

Many of the potential species considered during this survey are plants. During early March, most of these species have not yet sprouted, and as such, would not be detectable in appropriate habitat. The migratory and nocturnal species (most of the bird and bats) also had not yet returned from their overwintering grounds and also could not be

located in appropriate habitat. A list showing both the species and the areas recommended for additional surveys on Fort Belvoir is presented in Appendix 4.

4.0 RESULTS

4.1 Confirmed Threatened or Endangered Species (Federal List)

Because of the disturbed and developed conditions at both Fort Myer and Cameron Station (i.e. little unaltered habitat remains), the survey completed at these installations was very thorough. Fort Belvoir, however, contains approximately 4,500 acres which are still undeveloped. As a result, all of the undeveloped acreage could not be thoroughly surveyed for this BATES. The focus of the survey was on BRAC and Master Planning sites, since a Record of Decision (ROD) will be prepared for both and these are the areas where development/redevelopment might occur. Subareas (Figure 2) were visited to determine general species composition and habitat types associated with each.

Table 2 lists the types of habitat found in each area surveyed at Fort Belvoir, and Appendix 3 lists the species encountered in each area during the March site survey. While Fort Myer and Cameron Station both exhibit little habitat diversity or species diversity, Fort Belvoir, due to its rolling terrain and numerous creeks, streams and beaver ponds contains many different habitat types.

4.1.1 Fort Belvoir

One federally endangered species and one federal candidate species have been confirmed at Fort Belvoir. Each of these species also carries the same designation on Virginia's endangered species list.

A bald eagle (*Haliaeetus leucocephalus*) nest was located within Accotink Wildlife Refuge in February 1990 by Fort Belvoir staff (S. Belfit, pers. comm.). The nest appears to be a first year nest, but the adults did fledge one young this breeding season. The nest should be monitored for activity during subsequent breeding seasons. According to information provided by the BOVA office, bald eagles tend to nest close to the shore but will nest further inland in areas where shorelines have been disturbed. The normal time for nesting is from November through January (BOVA, 1990). Nesting territories are from 0.5 to 1.5 miles^2 throughout the range. Bald eagles nest almost exclusively in live trees (average height in the Chesapeake Bay region of 97 feet) (BOVA, 1990). Tree species used for nest sites include loblolly pine (most frequent), Virginia pine, oaks, tulip poplar, beech, and hickory. There are only two instances in the Chesapeake Bay area where the birds have nested on man-made structures, both in the late 1950's. The bald eagle feeds mainly on fish but also takes waterfowl, muskrats, (*Ondatra zibethicus*), cottontail rabbits, (*Sylvilagus floridanus*) and turtles, as well as invertebrates. This species is opportunistic and will utilize both live prey and carrion. Habitat modification and destruction of nests continue to be limiting factors for eagles in the Chesapeake Bay Region.

Table 2. Habitat types found in designated areas surveyed on Fort Belvoir (Areas identified on Figure 2).

Area	River-banks	Wooded Wetlands	Uplands	Rich Woods	Wet Meadows	Marshes & Swamps	Open Water	Urban/ Disturbed
T1		*	*				*	
T1A			*					*
T1B			*					*
T1C			*					*
T2	*							*
T3								*
T4		*	*				*	*
T5								*
T6A								*
T6B		*	*	*			*	*
T6C		*	*	*			*	*
T7	*	*	*	*	*	*	*	*
T8	*	*	*	*	*	*	*	*
T8A								*
T8B			*					*
T8C			*					*
T9		*	*	*		*	*	*
T9A		*		*	*	*		
T10	*	*	*		*	*	*	
T10A								*
T11	*	*	*			*	*	
T12			*					*
T13		*	*	*		*	*	
T14		*	*				*	*
T15A		*	*	*			*	*
T15B		*	*				*	*
T16		*	*	*		*	*	*
T17	*	*	*				*	*
F1	*	*		*	*	*	*	
F2	*	*		*	*	*	*	
F3	*	*		*	*	*	*	
F4	*	*		*	*	*	*	
R1			*					
W1	*	*	*	*	*	*	*	
W2	*	*	*	*	*	*	*	
W3	*	*	*	*	*	*	*	
W4	*	*	*	*	*	*	*	

In addition to the two federally endangered species discussed above, a small mammal survey at Fort Belvoir currently being conducted by George Mason University has resulted in the capture of several pygmy shrews (*Sorex hoyi winnemanna*), a federal candidate species, at sampling sites south of Route 1. This species occurs over a wide range of elevation and habitat type. It inhabits wooded and open areas, wet or dry. Most habitats are within close proximity to water. This nocturnal species forages in dead plant material and burrows in leaf mold in both dry and moist woodlands and grassy borders and is active year round (Virginia Department of Game and Inland Fisheries, 1990).

4.1.2 Cameron Station and Fort Myer

Due to the developed nature of Cameron Station and Fort Myer it is highly unlikely that any State or Federally endangered species would be found within the installation boundaries. No State or Federally endangered species were located during the site visit, nor was any suitable habitat observed.

4.2 Confirmed Rare Species (Virginia List)

4.2.1 Fort Belvoir

The following species, which are considered by the Virginia Natural Heritage Program to be Critically Imperiled in Virginia (5 or fewer distinct populations in the state; or few remaining individuals; especially vulnerable to extirpation), have been confirmed at Fort Belvoir:

American coot (*Fulica americana*) is found in open ponds and marshes as well as saltwater bays in winter. This coot builds a floating nest of stems and marsh plants well concealed in the marsh or near the marsh edge. It feeds on leaves, fronds, seeds, and roots of various aquatic plants such as pond weeds, water milfoil, and bur-reed. They also feed on small fishes, tadpoles, snails, worms and aquatic insects (Terres, 1980). The American coot is a regular fall, winter and early spring resident of the tidal marshes of Fort Belvoir (Abbott, 1988).

The double-crested cormorant (*Phalocrocorax auritus*) is found along lakes, rivers, swamps, and coastal areas. It nests in colonies on the ground (rocks) or in trees. It feeds primarily on fish but will also eat amphibians, reptiles, crustaceans, mollusks, and worms (Terres, 1980). This species is usually only found at the installation during the fall, winter and early spring (Abbott, 1988).

The green-backed heron (*Butorides striatus*) inhabits lake margins, streams, ponds, and marshes. It requires thick bushes or trees nearby for nesting and soft, muddy borders in which to search for its prey. Nests may be built away from the water in dry woods and orchards, or in open marshes away from trees (Terres, 1980). Green-backed herons are uncommon breeders at Fort Belvoir (Abbott, 1988).

The following species are considered Imperiled in Virginia by the Virginia Natural Heritage Program (between 5 and 20 distinct populations; or with many individuals in fewer populations; susceptible to becoming endangered) have been confirmed at Fort Belvoir:

The least bittern's (*Ixobrychus exilis*) habitat consists of freshwater marshes where cattails and reeds predominate, but it is also found in saltwater or brackish marshes near the coast in the South. It builds a nest platform of dead and living plants, 8 - 14 inches above the water. The Least Bittern feeds on fish, frogs, tadpoles, salamanders, leeches, crayfish, occasionally shrews and mice, dragonflies, and other aquatic insects (Terres, 1980). This species is a rare permanent resident at Fort Belvoir, but is a regular breeder (Abbott, 1988).

The purple finch (*Carpodacus purpureus*) inhabits coniferous woodlands, openings in swamps, streams, hillside pastures, ornamental conifers along country roads and in city parks and suburbs. It is primarily a seed eater and prefers to nest in spruces, pines, cedars, and fir trees (Terres, 1980). This species is a rare visitor to Fort Belvoir, usually found during spring and fall migrations (Abbott, 1988).

The common moorhen (*Gallinula chloropus*) prefers freshwater marshes of cattails, bulrushes and willows with open water areas. The marshes should have a shallow water edge averaging 6-12 inches deep and a maximum depth of 3-4 feet. The marshes need not be large areas or isolated from human activity, provided water quality is sufficient to support prey items. Nesting cover should be relatively dense and composed of either live or floating mats of vegetation. This species migrates south in the fall and usually returns to the northern portions of its range in April through early May (Terres, 1980). Common moorhens are rare, but regular breeders in the marshes of Fort Belvoir (Abbott, 1988).

The Forster's tern (*Sterna forsteri*) breeds most commonly in salt and brackish coastal marshes (Martin and Zwank, 1987). They do, however, occasionally nest in freshwater marshes, usually appropriating grebe nests or the top of muskrat dens in these situations. The nests in salt and brackish water marshes are usually constructed on mats of floating vegetation. They feed primarily on small fish, in salt and brackish marsh situations in water less than three feet deep, but will take large insects in the air as well (Martin and Zwank, 1987). In freshwater situations they seem to rely more heavily on insects caught either in the air or picked up off the surface of the water (Martin and Zwank, 1987). This species is known to breed within the boundaries of the Accotink Wildlife Refuge (Areas W-1, W-2 and W-3) (Abbott, 1988).

The magnolia warbler (*Dendroica magnolia*) is a neotropical migrant which nests primarily in coniferous trees throughout their summer range (Scott, 1987). The nest is usually built on horizontal branches or up against the trunk of the tree, generally less than 15 feet above the ground. The preferred breeding habitats are hemlock stands, low dense thickets of spruces and balsam firs, interspersed with clearings, as well as swamp and pond borders fringed with conifers. Magnolia warblers are

strictly insectivorous and glean insects, primarily pest species, from the bark of conifers. This species appears to be at the southern edge of its breeding range in northern Virginia (Scott, 1987). This species is a common spring and fall migrant visitor at Fort Belvoir (Abbott, 1988).

The following species are listed as Rare to Uncommon in Virginia by the Virginia Natural Heritage Program (between 20 and 100 distinct populations; or fewer populations with more individuals; susceptible to large scale disturbances) and have been confirmed on Fort Belvoir:

The wood turtle (*Clemmys insculpta*) is found only in the extreme northern counties in Virginia. Overgrown areas near water are their preferred habitat. Most individuals have a restricted home range, moving to more aquatic habitats in hot weather. The wood turtles diet consists of algae, grasses, leaves, berries, insects, mollusks, earthworms, and tadpoles (McCauley, 1946; Martof, et al. 1980). A small number of these turtles were found spread between areas T-15A and T-16 during the March 1990 field survey.

The king rail (*Rallus elegans*) utilizes a variety of habitats from coastal saltwater and brackish marshes to inland freshwater marshes. The distribution of this species seems to be closely tied to the distribution of muskrats, which open up feeding and drinking areas for the birds with their foraging activities. King rails prefer areas with large populations of fiddler crabs and crayfish, but they will also eat other invertebrates, small fish, and in the winter, seeds and other vegetable matter. Nest sites are usually confined to a platform in the shallow water area of the marsh. This species is considered by some authorities to be a freshwater race of the related clapper rail (*Rallus longirostris*) (Terres, 1980). This species uses the fresh and brackish water marshes at Fort Belvoir for breeding. These birds have been recorded breeding in areas W-1, W-2, W-3, W-4, T-16 and in the Dogue Creek marsh area within the HEC boundary (Abbott, 1988).

Bank swallows (*Riparia riparia*) are aerial insectivores that have very specific nesting habitat requirements. They traditionally utilized sandy and gravelly, steep, exposed banks of streams, lakes, rivers, and oceans. In more recent times, however, they have also begun to use gravel pit slopes, and railroad and highway embankments. They are colonial nesters and will reuse established colonies until the site is no longer suitable. Typically the birds excavate a tunnel, either straight into or angled slightly upward into the upper face of the bank. The tunnels are usually one inch high, two inches wide and range from 16-60 inches long. Most of the tunnels, however, range from 28-36 inches long (Terres, 1980). This species is an occasional breeder at Fort Belvoir (Abbott, 1988).

The Red-headed woodpecker (*Melanerpes erythrocephalus*) utilizes a wide variety of habitats including farm fields, open woods, bottomland forests, and backyards. This species feeds on a variety of items, but insects taken either in the air or off the ground comprise the majority of their diet. In the fall and winter they become heavily dependent upon

beechnuts and acorns and will move south as northern food supplies dwindle. Red-headed woodpeckers are cavity nesters and typically excavate a cavity 8-24 inches deep in the dead tops or stumps of oaks, ashes, maples, elms, sycamores, cottonwoods, and willows. The cavity is usually between 5 and 80 feet above the ground, and the entrance hole is generally 1.25 inches in diameter. They will also make use of utility poles and bird houses built for them. Unfortunately, their nesting cavities are usually taken over by the more aggressive, European starling (*Sturnus vulgaris*). Direct competition with European starlings for nest holes has led to the substantial decline of this species throughout most of its range (Terres, 1980). This species is a permanent resident at Fort Belvoir, in the woodlands bordering the numerous beaver ponds and marshes (Abbott, 1988).

The southern short-tailed shrew (*Blarina carolinensis*) closely resembles both the northern short-tailed shrew *Blarina brevicauda* and the least shrew *Cryptotis parva.* While these species can sometimes be separated by fur color and size, it is often necessary to consult an expert for a positive identification of the southern short-tailed shrew. This shrew is most common in the south-central and south-eastern Coastal Plain. It is rarely observed, however, as it travels predominantly under the leaf litter. Like voles, they travel in above-ground runways, most of which are utilized by a variety of species. Nests are usually 4-6 inches in diameter and are usually constructed of grass and leaves under a stump or fallen log. Females produce 3 to 4 litters between February and November. This shrew feeds on insects, eating at least their own weight each day. This species also produces a toxin which paralyzes its prey (Webster, et al. 1985). It was recorded at all of the sampling stations monitored as part of the Preliminary Evaluation of Vertebrate Diversity conducted by George Mason University (Ernst et al., 1990).

4.2.2 Cameron Station

No rare species were encountered at Cameron Station during the site visit, due to the Station's position in the Atlantic Flyway, however, and the presence of open water, a few of the species considered rare in Virginia may be found at the Station intermittently during migration. They include: American coot, double-crested cormorant, green-backed heron, least bittern, purple finch, common moorhen, Forster's tern, magnolia warbler and bank swallow. In addition, Forster's terns and bank swallows have been sighted during the spring and summer, foraging over the water at Cameron Lake and Back Lick Run (VSO, 1989). Due to the absence of suitable breeding habitat, however, it is assumed that the birds are either non-breeding adults or nesting elsewhere.

4.2.3 Fort Myer

The developed nature of Fort Myer, coupled with the absence of open water, minimizes the chances that any of the species considered rare in Virginia would be found at the installation. The only exceptions to this would be migrating magnolia warblers and perhaps purple finches at feeders.

4.3 Suitable Habitat for Rare, Threatened and Endangered Species

4.3.1 Fort Belvoir

Because of the diverse habitats at Fort Belvoir, several additional species could be located at the post. Since the survey was conducted in March, when many of the migratory species had not returned from overwintering grounds, and many of the plant species had not sprouted, specimens of some potential species, were not located. Table 3 lists the additional species for which suitable habitat exists at Fort Belvoir.

4.3.2 Cameron Station and Fort Myer

Since both of these installations have been heavily developed, it is unlikely that any additional species could be located at either location. The manicured nature of the remaining open areas precludes colonization by rare, threatened and endangered plants. In addition, the lack of diverse vegetation limits the value of both of these installations to other rare threatened and endangered species not discussed in Sections 4.2.2 and 4.2.3.

5.0 ENVIRONMENTAL EFFECTS OF THE PROPOSED ACTION TO LISTED SPECIES

5.1 FORT BELVOIR

Fort Belvoir will be affected by BRAC and master planning actions. Figure 5 shows the approximate locations of these actions. Many of these actions are currently in the planning stages, and a few are currently under construction.

All but three of the proposed actions shown on Figure 5 are currently sited in areas which are either significantly disturbed by training or heavy equipment use, or already contain structures or parking lots. Construction of the proposed facilities in these areas is not expected to have any significant impacts upon any rare, threatened or endangered species. Of the three actions which could impact threatened and endangered species two are master planning actions and the third involves an internal road extension. These projects include:

Map Location	Species
BRAC - 3	wood turtle
AFH - 3	wood turtle
NAF - 2	bald eagle
MCA - 25	bald eagle
MCA - 38	bald eagle

Table 3. Rare, Threatened and Endangered Species for which Suitable Habitat Exists at Fort Belvoir.

Scientific Name	Common Name	State Rank	Federal Status	State Status	Habitat
Plants					
Ampelopsis cordata	simple-leaved ampelopsis	S2		RSC	swamps and river banks
Anemone canadensis	round-leaved anemone	S1S2		RSC	low grounds
Asclepias rubra	red milkweed	S2			moist soil
Aster shortii	Short's aster	S2		RSC	banks, woodland borders
Blephila hirsuta	hairy woodmint	S1S2		RSC	woods and thickets
Buchnera americana	blue hearts	S2			sandy or gravelly soil
Carex cristatella	crested sedge	S1		RSC	meadows / thickets
Carex decomposita	large-panicled sedge	SH	C2		swamps
Carex hirtifolia	pubescent sedge	S1S2			woods, thickets
Carex hitchcockiana	Hitchcock's sedge	S2			woods, thickets
Carex interior	inland sedge	S1		RSC	wet soil
Carex lacustris	lake-bank sedge	S1		RSC	swamps
Carex lupuliformis	hop-like sedge	S1S2		RSC	swamps
Cassia fasciculata var. macrosperma	prairie senna	S1S2	C2	RSU	woodland borders
Centunculus minimus	chaffweed	S1			moist soil
Cirsium altissimum	roadside thistle	S2S3		RSC	fields, thickets
Cornus stolonifera	red-osier dogwood	S1		RSC	moist soil
Cuscuta coryli	hazel dodder	S2			on hazels, other shrubs or tall herbs
Cuscuta polygonorum	smartweed dodder	S1S2			on Polygonum and other herbs
Desmodium sessilifolia	sessile-leaved tick-trefoil	S1		RSC	dry soil
Eleocharis elliptica	slender spikerush	S1S2		RSC	
Erythronium albidum	white trout lily	S1		RSC	moist woods and thickets
Geum allepican	yellow avens	SH			meadows, thickets, woods
Helianthemum proprinquum	low frostweed	S1		RSU	dry soils
Limnobium spongia	American frog's-bit	S1S2		RSC	shallow, stagnant water
Liparis loesilii	fen orchis	S2		RSC	wet thickets, springy banks
Lythrum alatum	wing-angled loosestrife	S1		RSC	low grounds
Panax quinquefolius	American ginseng	S3S4	3C	LT	rich woods
Penstemon hirsutus	a beardtongue	S3		RSC	moist, sandy wood edges
Phacelia ranunculacea	blue scorpion-weed	S2		RSC	alluvial woods, floodplains
Potomogeton amplifolius	a pondweed	S2			ponds, lakes, slow streams
Potomogeton robbinsii	flatleaf pondweed	S1		RSC	ponds, lakes
Ptomogeton zosteriformis	flatstem pondweed	S1		RSC	still and running water
Pyrola chlorantha	greenish-flowered wintergreen	S1		RSC	dry woods
Pyrola secunda	one-sided wintergreen	S1		RSC	woods, thickets
Rhododendron arborescens	smooth azalea	S2		RSC	swamp forests, bogs
Rudbeckia triloba var. pinnatiloba	a black-eyed susan	S1	C2		basic to neutral soils
Sanicula trifoliata	large-fruited sanicle	S1		RSC	hilly woods

Table 3. Rare, Threatened and Endangered Species for which Suitable Habitat Exists at Fort Belvoir (continued).

Scientific Name	Common Name	State Rank	Federal Status	State Status	Habitat
Scirpus acutus	hard-stemmed bullrush	S1		RSC	fresh, alkali and brackish marshes
Scirpus etuberculatus	Canby bullrush	SH		RSU	inland freshwater marshes
Scirpus fluviatilis	river bullrush	S1		RSC	inland and coastal freshwater marshes
Senecio pauperculus	balsam ragweed	S1		RSC	basic soils, wood edges
Spartina pectinata	prairie cordgrass	S1S2			inland and coastal marshes, wet meadows
Spiraea latifolia	northern meadow-sweet	S1	PE	LE	moist and rocky ground
Triphora trianthophora	nodding pogonia	S1		RSC	rich woods
Utricularia vulgaris	a bladderwort	S1		RSC	freshwater
Valeriana pauciflora	valerian	S1		RSC	moist soil
Animals					
Stygobromis tenuis	a groundwater amphipod	S2S3			groundwater
Notropis bifrenatus	bridled shiner	S3		RSC	vegetated pools in streams
Lasionycteris noctivagans	silver-haired bat	S3			under loose bark, migrant
Myotis keeni	Keen's myotis	S3			loose bark, buildings
Condylura cristata	star-nosed mole	S3			moist soils near water

Key

LE - Listed Endangered
PE - Proposed Endangered
C1 - Candidate Species, category 1
C2 - Candidate Species, category 2
3C - Former Candidate, common or well protected
S1 - Critically Imperiled in Virginia often especially vulnerable to extirpation
S2 - Imperiled in Virginia susceptible to becoming endangered
S3 - Rare to uncommon may be susceptible to large scale disturbances
S4 - Common, usually not susceptible to immediate threats
SU - Status uncertain either due to low search effort or cryptic nature of species
RE - Recommended Endangered
RT - Recommended Threatened
RSC - Recommended Species of Special Concern
RSU - Recommended Status Undetermined

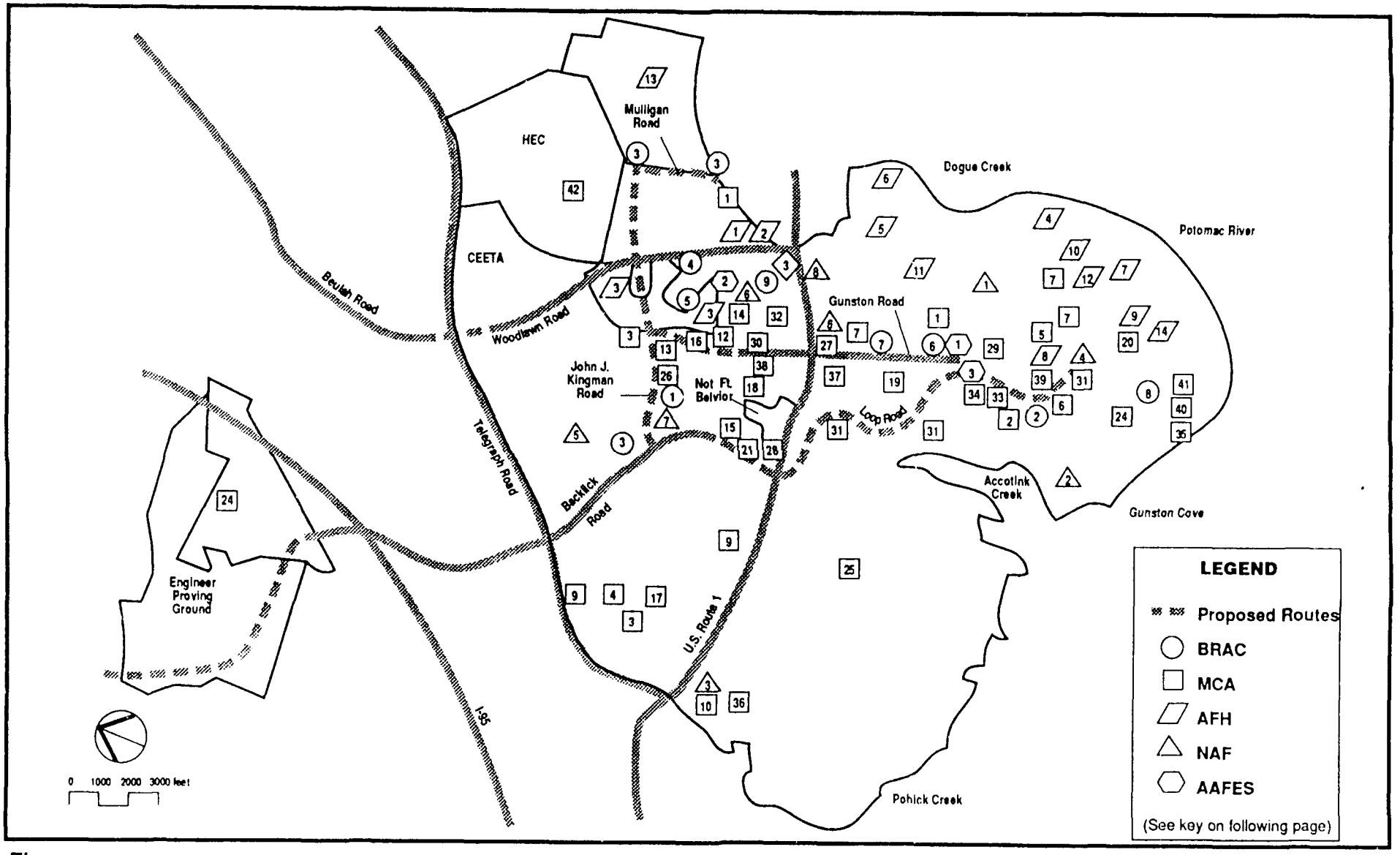


Figure
Locations of BRAC and Development Plan Sites

ENVIRONMENTAL IMPACT STATEMENT

Comprehensive Base Realignment/Closure
and Fort Belvoir Development
Arlington and Fairfax Counties and the City of Alexandria, VA

Key to Figure 1-2
Locations of BRAC and Development Plan Sites

Base Realignment and Closure (BRAC) Actions

1. Headquarters Complex
2. Industrial Park
3. Office Park Road
4. North Post Commissary Warehouse Addition
5. Post Exchange
6. Commissary
7. Administration Facility
8. Advanced Materials Laboratory
9. Branch Exchange (Convenience/Gas)
10. Modify Buildings 1466 and 1445 for Base Closure

Development Plan Actions

Military Construction Activity (MCA)

1. Child Development and Religious Education Centers
2. Electronics Supply and Maintenance Facility
3. DC Army National Guard Armory
4. DC Army National Guard Aircraft Parking Apron
5. Convert Buildings 206 and 208 to Classrooms
6. Veterinary Clinic
7. Operations Bldg Renovation, Engineer School Backfill
8. Telephone Switch upgrade, Post-wide
9. Fixed Wing Runway Extension
10. Old Guard Horse Stables
11. Main Sewer Line Upgrade, Post-wide
12. North Post Fire Station
13. Headquarters, Air Force Intelligence Agency
14. Physical Fitness Center
15. Va. Army National Guard Armory/Headquarters (29th LID)
16. Gunston Road Extension
17. DC Army National Guard Hangar Addition
18. Sea Bee Operational Storage Facility
19. Renovate Heat Plant
20. Renovate Building 361 for ADP
21. DC Army National Guard Academy
22. Electrical Upgrade, Post-wide, Phase I
23. Lateral Sewer Line Repair, Post-wide
24. Relocate EPG Test/Storage Facilities
25. Ammunition Storage Facility
26. Information Systems Facility
27. CIDC Field Operations Building
28. DC Army National Guard Cantonment Area
29. Main Post Library
(30. *there is no MCA 30)*

(Development Plan: MCA, continued)

31. Loop Road
32. Community Center/Welcome Center
33. Facility Engineer Maintenance Shop
34. Warehouses
35. Tactical Energy Systems Lab
36. Conforming Storage Building (DRMO)
37. Military Police Station
38. Reserve Center/OMA (80th Div)
39. Consolidated Maintenance Shop (DOL)
40. Electro-Optics Laboratory
41. Fatigue Test Facility
42. Potential 500-person Administrative Facility, HEC

Non-Appropriated Funds (NAF)

1. Youth Center
2. Tompkins Basin Recreation Area
3. Horse Stables
4. Benyuard Pool Addition
5. Golf Course
6. Corporate Fitness Center
7. Child Development Center
8. Temporary Lodging Facility

Army and Air Force Exchange Services (AAFES)

1. Fast Food Facility (Burger King)
2. Fast Food Facility (Chicken)
3. Car Care Facility

Army Family Housing (AFH)

1. Lewis Heights Renewal, Phase 1
2. Lewis Heights Renewal, Phase 2
3. 1,500 NCO Housing Units (New)
4. Dogue Creek Village Whole House Renewal
5. George Washington Village Whole House Renewal
6. River Village Whole House Renewal
7. Belvoir Village Whole House Renewal
8. Gerber Village Whole House Renewal
9. Visiting Officers Quarters Renovation
10. Jadwin Loop Whole House Renewal
11. Colyer Village Whole House Renewal
12. Rossell Loop Whole House Renewal
13. Woodlawn Village Whole House Renewal
14. Fairfax Village Whole House Renewal

BRAC 3 has the potential to impact a populaiton of wood turtles located near the proposed intersection of Woodlawn Road. Once the final alignment for the road has been determined, additional site surveys will be completed and additional coordination completed. The road will incorporate box culverts to facilitate the movement of the turtles and minimize road kills.

AFH 3 also has the potential to impact wood turtles at Fort Belvoir. As with BRAC 3, once siting has been determined additional surveys and agency coordination will be completed .

The ammunition storage facility proposed for MCA - 25 is located jsut outside the buffer required for the bald eagle's nest on post. Fort Belvoir personnel will monitor the use of the facility and the reactiono f the birds to determine if addtional management steps are warranted. An eagle management plan is currently being developed as part of the update to the Natural Resource Management Plan.

The boat traffic generated by NAF 2 and MCA 38 has the potential to effect not only the pair of bald eagle nesting at Fort Belvoir, but also two other pairs nesting nearby. One pair is located at Mason Neck NWR and the second is located on private property on Hallowing Point.

The reserve center operations will be structured so that training cruises are planned in areas determined to be least sensitive to disturbance during the breeding season.

Fort Belvoir personnel will monitor the activites of the eagles on the post and adopt an eagle management plan which will minimize the effects of boating and other similar activites to the eagles. The plan may require that portions of Gunston Cove be closed to boat traffic during the breeding season.

5.2 Cameron Station

5.2.1 Base Closure and Cleanup

As mandated by the Installation Restoration Program (IRP), the U.S. Army Toxic and Hazardous Materials Agency (USATHAMA) must provide clearance forCameron Station before reuse. The Enhanced Preliminary Assessment Report, Cameron Station, Alexandria, Virginia prepared by the Argonne National Laboratory for USATHAMA, indicates that several potential contaminated sites at Cameron Station. None of these sites, however, are "considered to be an imminent or substantial threat to the health of the surrounding populations or to the environment in general" (Argonne, 1989).

The clean-up operations required prior to excessing Cameron Station are not expected to have significant impacts on any rare species which could visit the site. Completely removing or filling Cameron Lake, if necessary, should not significantly impact the aquatic birds which have been recorded at the site, since other major waterways occur nearby which receive larger populations of these species during migration periods.

5.2.2 Reuse Alternatives

As mentioned in Section 1.0, the reuse plan has not been finalized for Cameron Station. The highest and best use study recently completed by the Baltimore District, U.S. Army Corps of Engineers, and the City of Alexandria Study suggests that the highest and best reuse for the parcel would be as a moderately intense mixed-use area. The studies recommended the area be developed primarily as residential with supporting retail and office complexes. The study further advised that approximately 30 percent of the parcel (roughly 49 acres) be left undeveloped for passive and active recreation. The Cameron Station Reuse Task Force has been organized to recommend a reuse plan. The plan is expected to be very similar to that outlined in the highest and best use study, and, as a result, would have similar environmental impacts.

The redevelopment of Cameron Station should not have any significant impact on rare, threatened or endangered species. No threatened or endangered species were observed on Cameron Station during the March 1990 field survey and, as there is no suitable habitat on the installation, it is unlikely that any of the species surveyed for would be found there. As discussed in Section 5.2.1, the rare migratory species currently utilizing the water bodies on, and adjacent to, Cameron Station can easily relocate to other waterways nearby and should not be effected by any reuse plan developed that is similar to the highest best study.

5.3 Fort Myer

The BRAC actions at Fort Myer will not impact any State or Federal endangered, threatened or rare species. All of the proposed sites (Figure 6) are either open fields, parking lots or contain existing structures which would be removed prior to the construction of the new facility.

6.0 ALTERNATIVES TO THE PROPOSED ACTIONS

6.1 Fort Belvoir

The alternatives to the proposed BRAC actions at Fort Belvoir involve the final siting of structures. The alternatives to Master Planning actions are final siting and size of structures, and the no action alternative. Based on the surveys conducted for this BATES, it would appear that four projects could impact rare, threatened or endangered species. BRAC 3 and AFH 3 will be desinged to minimize effects on wood turtles. This species is expected to elevated to state threatened status during the 1990 Virginia General Assemblt session. In addiiton NAF 2 and MCA 38 have the potential to impact three nesting pairs of bald eagles. Fort Belvoir personnel will coordinate these projects with the US Fish and Wildlife Service to develop and eagle management plan and a boat traffic management plan if required.

6.2 Cameron Station

There are no alternatives to base closure as stated in the Act. However, several alternative reuse plans for redevelopment may be evaluated for Cameron Station. Due to the poor quality of habitat at the installation, it is unlikely that any proposed reuse would significantly impact the use of the site by migratory species classified as rare, threatened or endangered.

6.3 Fort Myer

The alternatives to the BRAC actions scheduled for Fort Myer involve final siting of some of the larger facilities (Commissary, Administrative Building, etc.). The developed and manicured nature of the installation, however, coupled with the poor habitat quality and lack of rare, threatened and endangered species on the site, indicate that minimal impacts to wildlife would occur regardless of where the facilities were sited on Fort Myer.

7.0 CONCLUSIONS

7.1 Fort Belvoir

Potential habitat for endangered species exists within the training and other natural areas at Fort Belvoir. Due to the nature of this survey and previous site-specific surveys, additional protected species or their habitat could exist on the post. Additional species which could be found on the post and the areas where surveys based on habitat types should be conducted are listed in Appendix 4.

Much of the rare, threatened and endangered species habitat on Fort Belvoir is located within the floodplain, tributary and wetland systems of the Dogue, Accotink and Pohick Creek watersheds. One federally endangered species, the bald eagle, as well as one federal candidate species, the pygmy shrew, have been confirmed at Fort Belvoir. In addition, several species classified as rare in Virginia have also been confirmed at Fort Belvoir: American coot, double-crested cormorant, green-backed heron, least bittern, purple finch, common moorhen, Forster's tern, magnolia warbler, king rail, bank swallow, red-headed woodpecker, wood turtle, and southern short-tailed shrew. Additional site-specific surveys may reveal the presence of additional species.

The habitat for many of these species is located in wetlands which are protected by federal law and should not suffer any adverse impacts. The Chesapeake Bay Preservation Act will also serve to protect additional species located within protected areas and associated buffers. Upland species located outside of the buffer limits, however, are less protected by other laws.

As discussed in Section 5.1, Fort Belvoir personnel will develop an easgle management plan in coordination with the US Fish and Wildlife Service to protect the eagles both on the post and in the surrounding areas from adverse effects caused by boat traffic. In addition, final site design for BRAC 3 and AFH 3 will incorporate openspce, box culverts and buffers to protect the wood turtle population in the area.

7.2 Cameron Station and Fort Myer

Based on site surveys, little or no habitat exists on either Cameron Station or Fort Myer for rare, threatened and endangered species. The few rare species which utilize Cameron Lake, Back Lick Run and Holmes Run, in the vicinity of Cameron Station, during migration should not be significantly impacted by either the closure of the post or subsequent redevelopment and reuse since better quality habitat exists off-site, including but not limited to: the Potomac River, Hunting Creek, Huntley Meadows, Fort Belvoir, and Mason Neck National Wildlife Refuge.

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Appendix C

Fort Belvoir Wildlife Species

Appendix C. Terrestrial Wildlife of Fort Belvoir

Common Name	Scientific Name
greater siren	*Siren lacertina*
marbled salamander	*Ambystoma opacum*
Jefferson salamander	*Ambystoma jeffersonianum*
spotted salamander	*Ambystoma maculatum*
red-spotted newt	*Notophthalmus viridescens viridescens*
northern dusky salamander	*Desmognathus fuscus fuscus*
redback salamander	*Plethodon cinereus cinereus*
slimy salamander	*Plethodon glutinosus glutinosus*
four-toed salamander	*Hemidactylium scutatum*
eastern mud salamander	*Pseudotriton montanus montanus*
northern red salamander	*Psuedotriton ruber ruber*
northern two-lined salamander	*Eurycea bislineata bislineata*
longtail salamander	*Eurycea longicauda longicauda*
three-lined salamander	*Eurycea longicauda guttolineata*
eastern spadefoot	*Scaphiopus holbrooki holbrooki*
American toad	*Bufo americanus*
Fowler's toad	*Bufo woodhousii fowleri*
northern cricket frog	*Acris crepitans crepitans*
northern spring peeper	*Hyla crucifer*
green treefrog	*Hyla cinerea*
gray treefrog	*Hyla versicolor*
Cope's gray treefrog	*Hyla crysocelis*
upland chorus frog	*Pseudascris triseriata*
bullfrog	*Rana catesbeiana*
green frog	*Rana clamitans melanota*
wood frog	*Rana sylvatica*
southern leopard frog	*Rana sphenocephala*
pickerel frog	*Rana palustris*
common snapping turtle	*Chelydra serpentina*
stinkpot	*Sternotherus odoratus*
eastern mud turtle	*Kinosternon subrubrum subrubrum*
spotted turtle	*Clemmys guttata*
wood turtle	*Clemmys insculpta*
eastern box turtle	*Terrapene carolina carolina*
eastern painted turtle	*Chrysemys picta picta*
midland painted turtle	*Chrysemys picta marginata*
northern fence lizard	*Sceloporus undulatus hyacinthinus*
six-lined racerunner	*Cnemidophorous sexlineatus sexlineatus*
ground skink	*Scincella lateralis*
five-lined skink	*Eumeces fasiatus*
broadhead skink	*Eumeces laticeps*
southeastern five-lined skink	*Eumeces inexpectatus*
northern water snake	*Nerodia sipedon sipedon*
queen snake	*Regina septemvittata*
northern brown snake	*Storeria dekayi dekayi*
eastern garter snake	*Thamnophis sirtalis sirtalis*
eastern ribbon snake	*Thamnophis sauritus sauritus*

eastern earth snake	*Virgnia valeriae*
eastern hognose snake	*Heterodon platyrhinos*
northern ringneck snake	*Diadophis punctatus edwardsi*
eastern worm snake	*Carphophis amoenus amoenus*
northern black racer	*Coluber constrictor constrictor*
rough green snake	*Opheodrys aestivus*
corn snake	*Elaphe guttata guttata*
black rat snake	*Elaphe obsoleta obsoleta*
eastern kingsnake	*Lampropeltis getulus getulus*
eastern milk snake	*Lampropeltis triangulum*
scarlet kingsnake	*Lamprepeltis triangulum triangulum*
mole kingsnake	*Lampropeltis calligaster rhombomaculata*
scarlet snake	*Cemophora coccinea*
northern copperhead	*Agkistrodon contotrix mokasen*
red-throated loon	*Gavia stellata*
common loon	*Gavia immer*
pied-billed grebe	*Podilymbus podiceps*
horned grebe	*Podicepsauritus*
red-necked grebe	*Podiceps grisegena*
double-crested cormorant	*Phalacrocorax auritus*
American bittern	*Botaurus lentiginosus*
least bittern	*Ixobrychus exilis*
great blue heron	*Ardea herodias*
great egret	*Casmerodius albus*
snowy egret	*Egretta thula*
little blue heron	*Egretta caerulea*
green-backed heron	*Butorides striatus*
black-crowned night-heron	*Nycticorax nycticorax*
yellow-crowned night-heron	*Nycticorax violaceus*
tundra swan	*Cygnus columbianus*
Canada goose	*Branta canadensis*
wood duck	*Aix sponsa*
green-winged teal	*Anas crecca*
American black duck	*Anas rubripes*
mallard	*Anas platyrhynchos*
northern pintail	*Anas acuta*
blue-winged teal	*Anas discors*
northern shoveler	*Anas clypeata*
gadwall	*Anas strepera*
American wigeon	*Anas americana*
canvasback	*Aythya valisineria*
redhead	*Aythya americana*
ring-necked duck	*Aythya collaris*
greater scaup	*Aythya marila*
lesser scaup	*Aythya affinis*
oldsquaw	*Clangula hyenalis*
common goldeneye	*Bucephala clangula*
bufflehead	*Bucephala albeola*
hooded merganser	*Lophodytes cuculattus*
common merganser	*Mergus merganser*
red-breasted merganser	*Mergus serrator*

ruddy duck	*Oxyura jamaicensis*
black vulture	*Coragyps atratus*
turkey vulture	*Cathartes aura*
osprey	*Pandion haliaetus*
bald eagle	*Haliaeetus leucocephalus*
northern harrier	*Circus cyaneus*
sharp-shinned hawk	*Accipter striatus*
Cooper's hawk	*Accipiter cooperi*
red-shouldered hawk	*Buteo lineatus*
broad-winged hawk	*Buteo platypterus*
red-tailed hawk	*Buteo jamaicensis*
rough-legged hawk	*Buteo lagopus*
American kestrel	*Falco sparverius*
merlin	*Falco columbarius*
peregrine falcon	*Falco peregrinus*
wild turkey	*Meleagris gallopava*
northern bobwhite	*Colinus virginianus*
king rail	*Rallus elegans*
Virginia rail	*Rallus limicola*
sora	*Porzana carolina*
common moorhen	*Gallinula chloropus*
American coot	*Fulica americana*
semipalmated plover	*Charadrius semipalmatus*
killdeer	*Charadrius vociferus*
greater yellowlegs	*Tringa melanoleuca*
lesser yellowlegs	*Tringa flavipes*
solitary sandpiper	*Tringa solitaria*
spotted sandpiper	*Actitis macularia*
semipalmated sandpiper	*Calidris pusilla*
western sandpiper	*Calidris mauri*
least sandpiper	*Calidris minutilla*
pectoral sandpiper	*Calidris melanotos*
common snipe	*Gallinago gallinago*
American woodcock	*Scolopax minor*
laughing gull	*Larus atricilla*
Bonaparte's gull	*Larus philadelphia*
ring-billed gull	*Larus delawarensis*
herring gull	*Larus argentatus*
great black-backed gull	*Larus marinus*
Caspian tern	*Sterna caspia*
common tern	*Sterna hirundo*
Forster's tern	*Sterna forsteri*
black tern	*Chlidonias niger*
rock dove	*Columba livia*
mourning dove	*Zenaida macroura*
black-billed cuckoo	*Coccyzus minor*
yellow-billed cuckoo	*Coccyzus americanus*
eastern screech-owl	*Otus asio*
great horned owl	*Bubo virginianus*
barred owl	*Strix varia*
common night hawk	*Chordeiles minor*

whip-poor-will	*Caprimulgus vociferus*
chimney swift	*Chaetura pelagica*
ruby-throated hummingbird	*Archilochus colubris*
belted kingfisher	*Ceryle alcyon*
red-headed woodpecker	*Melanerpes erthrocephalus*
red-bellied woodpecker	*Melanerpes carolinus*
yellow-bellied sapsucker	*Sphyrapicus varius*
downy woodpecker	*Picoides pubescens*
hairy woodpecker	*Picoides villosus*
northern flicker	*Colaptes auratus*
pileated woodpecker	*Dryocopus pileatus*
olive-sided flycatcher	*Conotopus borealis*
eastern wood-peewee	*Conotopus virens*
yellow-bellied flycatcher	*Empidonax flaviventris*
acadian flycatcher	*Empidonax virescens*
alder flycatcher	*Empidonax alnorum*
willow flycatcher	*Empidonax trailii*
least flycatcher	*Empidonax minimus*
eastern phoebe	*Sayorinis phoebe*
great crested flycatcher	*Myiarchus crinitus*
eastern kingbird	*Tyrannus tyrannus*
water pipit	*Anthus spinoletta*
horned lark	*Eremophila alpestris*
purple martin	*Progne subis*
tree swallow	*Tachycineta bicolor*
northern rough-winge swallow	*Stelgidopterys serripennis*
bank swallow	*Riparia riparia*
cliff swallow	*Hirundo pyrrhonota*
barn swallow	*Hirundo rustica*
blue jay	*Cyanocitta cristata*
American crow	*Corvus americana*
fish crow	*Corvus ossifragus*
Carolina chickadee	*Paurus carolinensis*
tufted titmouse	*Parus bicolor*
red-breasted nuthatch	*Sitta canadensis*
white-breasted nuthatch	*Sitta carolinensis*
brown creeper	*Certhia americana*
Carolina wren	*Thryothorus ludovicianus*
house wren	*Troglodytes aedon*
winter wren	*Troglodytes troglodytes*
marsh wren	*Cistothorus palustris*
golden-crowned kinglet	*regulus satrapa*
ruby-crowned kinglet	*Regulus calendula*
blue-gray gnatcatcher	*Plioptila caerula*
eastern bluebird	*Sialia sialis*
veery	*Catharus fuscescens*
gray-cheeked thrush	*Catharys minimus*
Swainson's thrush	*Catharus ustulatus*
hermit thrush	*Catharus guttatus*
wood thrush	*Hylocicla mustelina*
American robin	*Turdus migratorius*

gray catbird	*Dumetella carolinensis*
northern mockingbird	*Mimus polyglottos*
brown thrasher	*Toxostoma rufum*
cedar waxwing	*Bombycilla cedrorum*
loggerhead shrike	*Lanius ludovicianus*
European starling	*Sturnus vulgaris*
white-eyed vireo	*Vireo griseus*
solitary vireo	*Vireo solitarius*
yellow-throated vireo	*Vireo flavifrons*
warbling vireo	*Vireo gilvus*
Philadelphia vireo	*Vireo philadelphicus*
red-eyed vireo	*Vireo olivaceus*
blue-winged warbler	*Vermivora pinus*
golden-winged warbler	*Vermivora chrysoptera*
Tennesee warbler	*Vermivora peregrina*
orange-crowned warbler	*Vermivora celata*
Nashville warbler	*Vermivora ruficapilla*
northern parula	*Parula americana*
yellow warbler	*Dendroica petechia*
chestnut-sided warbler	*Dendroica pensylvanica*
magnolia warbler	*Dendroica magnolia*
Cape May warbler	*Dendroica tigrina*
black-throated blue warbler	*Dendroica caerulescens*
yellow-rumped warbler	*Dendroica coronata*
black-throated green warbler	*Dendroica virens*
blackburnian warbler	*Dendroica fusca*
yellow-throated warbler	*Dendroica dominica*
pine warbler	*Dendroica pinus*
prairie warbler	*Dendroica discolor*
palm warbler	*Dendroica palmarum*
bay-breasted warbler	*Dendroica castanea*
blackpoll warbler	*Dendroica straita*
cerulean warbler	*Dendroica cerulea*
black-and-white warbler	*Mniotila varia*
American redstart	*Setophaga ruticilla*
prothonotary warbler	*Protonotaria citrea*
worm-eating warbler	*Helmitheros vermivorus*
ovenbird	*Seiurus aurocapillus*
northern waterthrush	*Seiurus noveboracensis*
Louisiana waterthrush	*Sieurus motacilla*
Kentucky warbler	*Oporornis formosus*
Connecticut warbler	*Oporornis agilis*
mourning warbler	*Oporornis philadelphia*
common yellowthroat	*Geothlypis trichas*
hooded warbler	*Wilsonia citrina*
Wilson's warbler	*Wilsonia pusilla*
Canada warbler	*Wilsonia canadensis*
yellow-breasted chat	*Icteria virens*
summer tanager	*Piranga olivacea*
scarlet tanager	*Piranga rubra*
northern cardinal	*Cardinalis cardinalis*

rose-breated grosbeak	*Pheucticus ludovicianus*
blue grosbeak	*Guiraca caerulea*
indigo bunting	*Passerina cyanea*
rufous-sided towhee	*Pipilo erythrophthalmus*
American tree sparrow	*Spizella arborea*
chipping sparrow	*Spizella passerina*
field sparrow	*Spizella pusilla*
vesper sparrow	*Pooecetes gramineus*
savanah sparrow	*Passerculus sandwichensis*
fox sparrow	*Passerella iliaca*
song sparrow	*Melospiza melodia*
Lincoln's sparrow	*Melospiza lincolnii*
swamp sparrow	*Melospiza geogiana*
white-throated sparrow	*Zonotrichia albicollis*
white-crowned sparrow	*Zonotrichia leucophrys*
dark-eyed junco	*Junco hyemalis*
bobolink	*Dolichonyx oryzivorus*
red-winged blackbird	*Agelaius phoeniceus*
eastern meadowlark	*Sturnella magna*
rusty blackbird	*Euphagus carolinus*
common grackle	*Quiscalus quiscula*
brown-headed cowbird	*Molothrus ater*
orchard oriole	*Icterus spurius*
northern oriole	*Icterus galbula*
purple finch	*Carpodacus purpureus*
house finch	*Carpodacus mexicanus*
red crossbill	*Loxia curvirostra*
white-winged crossbill	*Loxia leucoptera*
pine siskin	*Carduelis pinus*
American goldfinch	*Carduelis tristis*
evening grosbeak	*Coccothaustes vespertinus*
house sparrow	*Passer domesticus*
Virginia opossum	*Didelphis virginiana*
southeastern shrew	*Sores longirostris*
pygmy shrew	*Sorex hoyi*
least shrew	*Cryptotis parva*
northern short-tailed shrew	*Sorex brevicauda*
southern short-tailed shrew	*Blarina carolinensis*
star-nosed mole	*Condylura cristata cristata*
eastern mole	*Scalopus aquaticus*
little brown bat	*Myotis lucifugus*
silver-haired bat	*I asionycteris noctivagans*
eastern pipistrelle	*Pipistrellus subflavus*
big brown bat	*Eptesicus fuscus*
red bat	*Lasiurus borealis*
hoary bat	*Lasiurus cinereus*
seminole bat	*Lasiurus seminolus*
evening bat	*Nycticeius humeralis*
raccoon	*Procyon lotor*
long-tailed weasel	*Mustel frenata*
common mink	*Mustela vison*

river otter	*Lutra canadensis*
striped skunk	*Mephitis mephitis*
red fox	*Vulpes vulpes*
eastern gray fox	*Urocyon cinereoargentus*
woodchuck	*Marmota monax*
Fisher's eastern chipmunk	*Tamias striatus*
northern gray squirrel	*Sciurus carolinensis*
fox squirrel	*Sciurus niger*
red squirrel	*Tamaisciurus hudsonicus*
southern flying squirrel	*Glaucomys volans*
beaver	*Castor canandensis*
eastern harvest mouse	*Reithrodontomys humulis*
deer mouse	*Peromyscus maniculatus*
northern white-footed mouse	*Peromyscus leucopus*
marsh rice rat	*Oryzomys palustris*
meadow vole	*Microtus pennsylvanicus*
pine vole	*Microtus pinetorum*
muskrat	*Ondatra zibethicus*
Norway rat	*Rattus norvegicus*
house mouse	*Mus musculus*
meadow jumping mouse	*Zapus hudsonius*
eastern cottontail	*Sylvilagus floridanus*
white-tailed deer	*Odocoileus virginianus*

Source: Biota of Virginia (BOVA), Virginia Game and Inland Fisheries (1990).

Appendix D

Rare Threatened and Endangered Species
for which Habitat exists at Fort Belvoir

Appendix D. Rare, Threatened and Endangered Species for which Suitable Habitat Exists at Fort Belvoir.

Scientific Name	Common Name	State Rank	Federal Status	State Status	Habitat
Plants					
Ampelopsis cordata	simple-leaved ampelopsis	S2		RSC	swamps and river banks
Anemone canadensis	round-leaved anemone	S1S2		RSC	low grounds
Asclepias rubra	red milkweed	S2			moist soil
Aster shortii	Short's aster	S2		RSC	banks, woodland borders
Blephila hirsuta	hairy woodmint	S1S2		RSC	woods and thickets
Buchnera americana	blue hearts	S2			sandy or gravelly soil
Carex cristatella	crested sedge	S1		RSC	meadows / thickets
Carex decomposita	large-panicled sedge	SH	C2		swamps
Carex hirtifolia	pubescent sedge	S1S2			woods, thickets
Carex hitchcockiana	Hitchcock's sedge	S2			woods, thickets
Carex interior	inland sedge	S1		RSC	wet soil
Carex lacustris	lake-bank sedge	S1		RSC	swamps
Carex lupuliformis	hop-like sedge	S1S2		RSC	swamps
Cassia fasciculata var. macrosperma	prairie senna	S1S2	C2	RSU	woodland borders
Centunculus minimus	chaffweed	S1			moist soil
Cirsium altissimum	roadside thistle	S2S3		RSC	fields, thickets
Cornus stolonifera	red-osier dogwood	S1		RSC	moist soil
Cuscuta coryli	hazel dodder	S2			on hazels, other shrubs or tall herbs
Cuscuta polygonorum	smartweed dodder	S1S2			on Polygonum and other herbs
Desmodium sessilifolia	sessile-leaved tick-trefoil	S1		RSC	dry soil
Eleocharis elliptica	slender spikerush	S1S2		RSC	
Erythronium albidum	white trout lily	S1		RSC	moist woods and thickets
Geum allepican	yellow avens	SH			meadows, thickets, woods
Helianthemum proprinquum	low frostweed	S1		RSU	dry soils
Limnobium spongia	American frog's-bit	S1S2		RSC	shallow, stagnant water
Liparis loesilii	fen orchis	S2		RSC	wet thickets, springy banks
Lythrum alatum	wing-angled loosestrife	S1		RSC	low grounds
Panax quinquefolius	American ginseng	S3S4	3C	LT	rich woods
Penstemon hirsutus	a beardtongue	S3		RSC	moist, sandy wood edges
Phacelia ranunculacea	blue scorpion-weed	S2		RSC	alluvial woods, floodplains
Potomogeton amplifolius	a pondweed	S2			ponds, lakes, slow streams
Potomogeton robbinsii	flatleaf pondweed	S1		RSC	ponds, lakes
Ptomogeton zosteriformis	flatstem pondweed	S1		RSC	still and running water
Pyrola chlorantha	greenish-flowered wintergreen	S1		RSC	dry woods
Pyrola secunda	one-sided wintergreen	S1		RSC	woods, thickets
Rhododendron arborescens	smooth azalea	S2		RSC	swamp forests, bogs
Rudbeckia triloba var. pinnatiloba	a black-eyed susan	S1	C2		basic to neutral soils
Sanicula trifoliata	large-fruited sanicle	S1		RSC	hilly woods

Scientific Name	Common Name	State Rank	Federal Status	State Status	Habitat
Scirpus acutus	hard-stemmed bullrush	S1		RSC	fresh, alkali and brackish marshes
Scirpus etuberculatus	Canby bullrush	SH		RSU	inland freshwater marshes
Scirpus fluviatilis	river bullrush	S1		RSC	inland and coastal freshwater marshes
Senecio pauperculus	balsam ragweed	S1		RSC	basic soils, wood edges
Spartina pectinata	prairie cordgrass	S1S3			inland and coastal marshes, wet meadows
Spiraea latifolia	northern meadow-sweet	S1	PE	LE	moist and rocky ground
Triphora trianthophora	nodding pogonia	S1		RSC	rich woods
Utricularia vulgaris	a bladderwort	S1		RSC	freshwater
Valeriana pauciflora	valerian	S1		RSC	moist soil
Animals					
Stygobromis tenuis	a groundwater amphipod	S2S3			groundwater
Notropis bifrenatus	bridled shiner	S3		RSC	vegetated pools in streams
Lasionycteris noctivagans	silver-haired bat	S3			under loose bark, migrant
Myotis keeni	Keen's myotis	S3			loose bark, buildings
Condylura cristata	star-nosed mole	S3			moist soils near water

Key

LE - Listed Endangered
PE - Proposed Endangered
C1 - Candidate Species, category 1
C2 - Candidate Species, category 2
3C - Former Candidate, common or well protected
S1 - Critically Imperiled in Virginia often especially vulnerable to extirpation
S2 - Imperiled in Virginia susceptible to becoming endangered
S3 - Rare to uncommon may be susceptible to large scale disturbances
S4 - Common, usually not susceptible to immediate threats
SU - Status uncertain either due to low search effort or cryptic nature of species
RE - Recommended Endangered
RT - Recommended Threatened
RSC - Recommended Species of Special Concern
RSU - Recommended Status Undetermined

Appendix E

Chesapeake Bay Program Information

MEMORANDUM OF AGREEMENT BETWEEN THE DEPARTMENT OF THE ARMY AND THE ENVIRONMENTAL PROTECTION AGENCY CONCERNING FEDERAL ENFORCEMENT FOR THE SECTION 404 PROGRAM OF THE CLEAN WATER ACT

I. PURPOSE AND SCOPE

The United States Department of the Army (Army) and the United States Environmental Protection Agency (EPA) hereby establish policy and procedures pursuant to which they will undertake federal enforcement of the dredged and fill material permit requirements ("Section 404 program") of the Clean Water Act (CWA). The U.S Army Corps of Engineers (Corps) and EPA have enforcement authorities for the Section 404 program, as specified in Sections 301(a), 308, 309, 404(n), and 404(s) of the CWA. In addition, the 1987 Amendments to the CWA (the Water Quality Act of 1987) provide new administrative penalty authority under Section 309(g) for violations of the Section 404 program. For purposes of effective administration of these statutory authorities, this Memorandum of Agreement (MOA) sets forth an appropriate allocation of enforcement responsibilities between EPA and the Corps. The prime goal of the MOA is to strengthen the Section 404 enforcement program by using the expertise, resources and initiative of both agencies in a manner which is effective and efficient in achieving the goals of the CWA.

II. POLICY

A. *General.* It shall be the policy of the Army and EPA to maintain the integrity of the program through federal enforcement of Section 404 requirements. The basic premise of this effort is to establish a frame:k for effective Section 404 enforcement with very little overlap. EPA will conduct initial on-site investigations when it is efficient with respect to available time, resources and/or expenditures, and use its authorities as provided in this agreement. In the majority of enforcement cases the Corps, because it has more field resources, will conduct initial investigations and use its authorities as provided in this agreement. This will allow each agency to play a role in enforcement which concentrates its resources in those areas for which its authorities and expertise are best suited. The Corps and EPA are encouraged to consult with each other on cases involving novel or important legal issues and/or technical situations. Assistance from the U.S. Fish and Wildlife Service (FWS), the National Marine Fisheries Service (NMFS) and other federal, state, tribal and local agencies will be sought and accepted when appropriate.

Encl 1

B. *Geographic Jurisdictional Determinations.* Geographic jurisdictional determinations for a specific case will be made by the investigating agency. If asked for an oral decision, the investigator will caution that oral statements regarding jurisdiction are not an official agency determination. Each agency will advise the other of any problem trends that they become aware of through case by case determinations and initiate interagency discussions or other action to address the issue. (Note: Geographic jurisdictional determinations for "special case" situations and interpretation of Section 404(f) exemptions for "special Section 404(f) matters" will be handled in accordance with the Memorandum of Agreement Between the Department of the Army and the Environmental Protection Agency Concerning the Determination of the Geographic Jurisdiction of the Section 404 Program and the Application of the Exemptions Under Section 404(f) of the Clean Water Act.)

C. *Violation Determinations.* The investigating agency shall be responsible for violation determinations, for example, the need for a permit. Each agency will advise the other of any problem trends that they become aware of through case by case determinations and initiate interagency discussions or other action to address the issue.

D. *Lead Enforcement Agency.* The Corps will act as the lead enforcement agency for all violations of Corps-issued permits. The Corps will also act as the lead enforcement agency for unpermitted discharge violations which do not meet the criteria for forwarding to EPA, as listed in Section III.D. of this MOA. EPA will act as the lead enforcement agency on all unpermitted discharge violations which meet those criteria. The lead enforcement agency will complete the enforcement action once an investigation has established that a violation exists. A lead enforcement agency decision with regard to any issue in a particular case, including a decision that no enforcement action be taken, is final for that case. This provision does not preclude the lead enforcement agency from referring the matter to the other agency under Sections III.D.2 and III.D.4 of this MOA.

E. *Environmental Protection Measures.* It is the policy of both agencies to avoid permanent environmental harm caused by the violator's activities by requiring remedial actions or ordering removal and restoration. In those cases where a complete remedy/removal is not appropriate, the violator may be required, in addition to other legal remedies which are appropriate (e.g., payment of administrative penalties) to provide compensatory mitigation to compensate for the harm caused by such illegal actions. Such compensatory mitigation activities shall be placed as an enforceable requirement upon a violator as authorized by law.

III. PROCEDURES

A. *Flow chart.* The attached flow chart provides an outline of the procedures

EPA and the Corps will follow in enforcement cases involving unpermitted discharges. The procedures in (B.), (C.), (D.), (E.) and (F.) below are in a sequence in which they could occur. However, these procedures may be combined in an effort to expedite the enforcement process.

B. *Investigation.* EPA, if it so requests and upon prior notification to the Corps, will be the investigating agency for unpermitted activities occurring in specially defined geographic areas (e.g., a particular wetland type, areas declared a "special case" within the meaning of the Memorandum of Agreement Between the Department of the Army and the Environmental Protection Agency Concerning the Determination of the Geographic Jurisdiction of the Section 404 Program and the Application of the Exemptions Under Section 404(f) of the Clean Water Act). Timing of investigations will be commensurate with agency resources and potential environmental damage. To reduce the potential for duplicative federal effort, each agency should verify prior to initiating an investigation that the other agency does not intend or has not already begun an investigation of the same reported violation. If a violation exists, a field investigation report will be prepared which at a minimum provides a detailed description of the illegal activity, the existing environmental setting, initial view on potential impacts and a recommendation on the need for initial corrective measures. Both agencies agree that investigations must be conducted in a professional, legal manner that will not prejudice future enforcement action on the case. Investigation reports will be provided to the agency selected as the lead on the case.

C. *Immediate Enforcement Action.* The investigating or lead enforcement agency should inform the responsible parties of the violation and inform them that all illegal activity should cease pending further federal action. A notification letter or administrative order to that effect will be sent in the most expeditious manner. If time allows, an order for initial corrective measures may be included with the notification letter or administrative order. Also, if time allows, input from other federal, state, tribal and local agencies will be considered when determining the need for such initial corrective measures. In all cases the Corps will provide EPA a copy of its violation letters and EPA will provide the Corps copies of its §308 letters and/or §309 administrative orders. These communications will include language requesting the other agency's views and recommendations on the case. The violator will also be notified that the other agency has been contacted.

D. *Lead Enforcement Agency Selection.* Using the following criteria, the investigating agency will determine which agency will complete action on the enforcement case:

1. EPA will act as the lead enforcement agency when an unpermitted activity involves the following:

a. Repeat Violator(s);
b. Flagrant Violation(s);
c. Where EPA requests a class of cases or a particular case; or
d. The Corps recommends that an EPA administrative penalty action may be warranted.

2. The Corps will act as the lead enforcement agency in all other unpermitted cases not identified in Part III D.1. above. Where EPA notifies the Corps that, because of limited staff resources or other reasons, it will not take action on a specific case, the Corps may take action commensurate with resource availability.

3. The Corps will act as the lead enforcement agency for Corps-issued permit condition violations.

4. Where EPA requests the Corps to take action on a permit condition violation, this MOA establishes a "right of first refusal" for the Corps. Where the Corps notifies EPA that, because of limited staff resources or other reasons, it will not take an action on a permit condition violation case, the EPA may take action commensurate with resource availability. However, a determination by the Corps that the activity is in compliance with the permit will represent a final enforcement decision for that case.

E. *Enforcement Response.* The lead enforcement agency shall determine, based on its authority, the appropriate enforcement response taking into consideration any views provided by the other agency. An appropriate enforcement response may include an administrative order, administrative penalty complaint, a civil or criminal judicial referral or other appropriate formal enforcement response.

F. *Resolution.* The lead enforcement agency shall make a final determination that a violation is resolved and notify interested parties so that concurrent enforcement files within another agency can be closed. In addition, the lead enforcement agency shall make arrangements for proper monitoring when required for any remedy/removal, compensatory mitigation or other corrective measures.

G. *After-the-Fact Permits.* No after-the-fact (ATF) permit application shall be accepted until resolution has been reached through an appropriate enforcement response as determined by the lead enforcement agency (e.g., until all administrative, legal and/or corrective action has been completed, or a decision has been made that no enforcement action is to be taken).

IV. RELATED MATTERS

A. *Interagency Agreements.* The Army and EPA are encouraged to enter into interagency agreements with other federal, state, tribal and local agencies which will provide assistance to the Corps and EPA in pursuit of Section 404 enforcement activities. For example, the preliminary enforcement site investigations or post-case monitoring activities required to ensure compliance with any enforcement order can be delegated to third parties (e.g., FWS) who agree to assist Corps/EPA in compliance efforts. However, only the Corps or EPA may make a violation determination and/or pursue an appropriate enforcement response based upon information received from a third party.

B. *Corps/EPA Field Agreements.* Corps Division or District offices and their respective EPA Regional offices are encouraged to enter into field level agreements to more specifically implement the provisions of this MOA.

C. *Data Information Exchange.* Data which would enhance either agency's enforcement efforts should be exchanged between the Corps and EPA where available. At a minimum, each agency shall begin to develop a computerized data list of persons receiving ATF permits or that have been subject to a Section 404 enforcement action subsequent to February 4, 1987 (enactment date of the 1987 Clean Water Act Amendments) in order to provide historical compliance data on persons found to have illegally discharged. Such information will help in an administrative penalty action to evaluate the statutory factor concerning history of a violator and will help to determine whether pursuit of a criminal action is appropriate.

V. GENERAL

A. The procedures and responsibilities of each agency specified in this MOA may be delegated to subordinates consistent with established agency procedures.

B. The policy and procedures contained within this MOA do not create any rights, either substantive or procedural, enforceable by any party regarding an enforcement action brought by either agency or by the U.S. Deviation or variance from these MOA procedures will not constitute a defense for violators or others concerned with any Section 404 enforcement action.

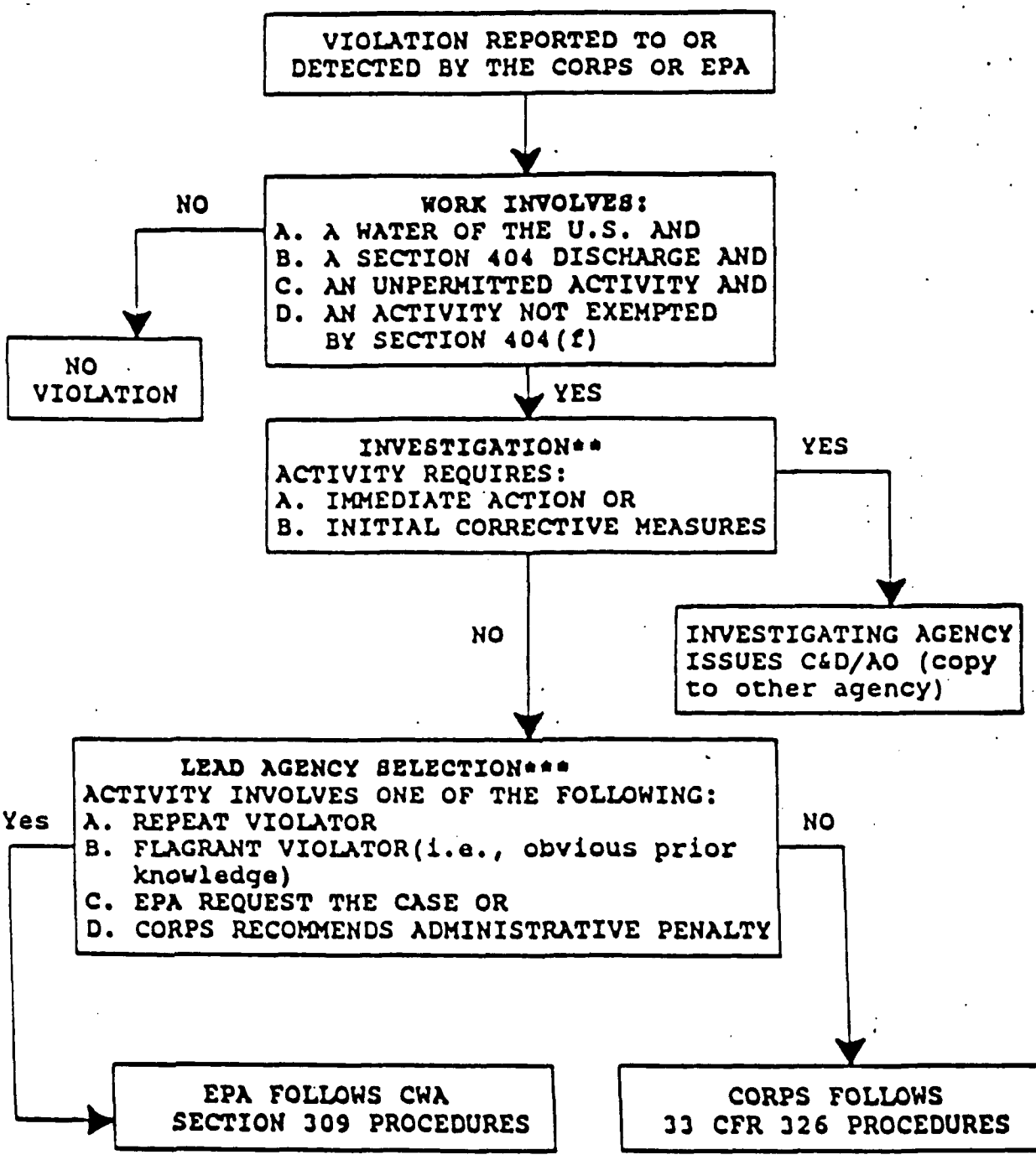
C. Nothing in this document is intended to diminish, modify or otherwise affect the statutory or regulatory authorities of either agency. All formal guidance interpreting this MOA shall be issued jointly.

D. This agreement shall take effect 60 days after the date of the last signature below and will continue in effect for five years unless extended, modified or revoked by agreement of both parties, or revoked by either party alone upon six months written notice, prior to that time.

for Robert W. Page (Date)
Assistant Secretary of
the Army (Civil Works)

Nov. 19, 1999

Rebecca W. Hanmer (Date)
Acting Assistant Administrator
for Water
U.S. Environmental Protection Agency



* Enforcement procedures for permit condition violation cases are set forth at Part III.D.3. and III.D.4.

** Procedures for investigating unpermitted activity cases are set forth at Part III.B.

*** Examples of situations in which "C" & "D" might arise include cases which are important due to deterrent value, due to the violation occurring in a critical priority resource or in an advanced identification area, involving an uncooperative individual, etc.

Chesapeake Executive Council

Federal Workplan

Chesapeake Bay Program

Agreement Commitment Report

July 1988

ADOPTION STATEMENT

We, the undersigned, adopt the **Federal Workplan** in fulfillment of Governance Commitment Number 8 of the 1987 Chesapeake Bay Agreement:

> *"...by July 1988, the Environmental Protection Agency, acting for the federal government, will develop a coordinated, federal agency workplan which identifies specific federal programs to be integrated into a coordinated federal effort to support the restoration of the Chesapeake Bay."*

The Federal Workplan describes each participating agency's Bay initiatives, the current level of coordination, outlines a process for expanding that cooperation, and points to future directions for agency efforts in support of the Agreement. Agencies have included projections of potential programs and projects for the future which may be the basis for coordinated, complementary budget proposals.

In adopting the Federal Workplan, we call upon the participating federal agencies to:

1. Review and revise the document annually;

2. Report to the Executive Council annually on progress in implementing the Workplan and in improving coordination among the agencies; and

3. Work with the Implementation Committee to identify opportunities for future federal cooperation and coordination in implementing the 1987 Chesapeake Bay Agreement.

For the Commonwealth of Virginia

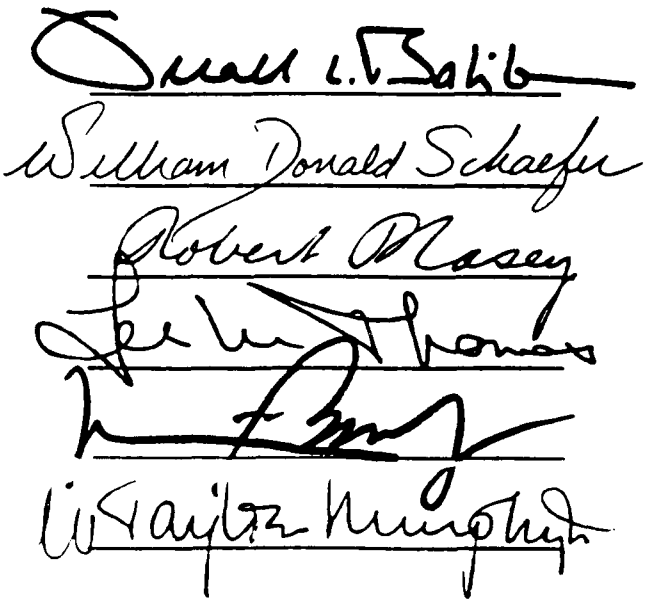
For the State of Maryland

For the Commonwealth of Pennsylvania

For the United States of America

For the District of Columbia

For the Chesapeake Bay Commission



Chesapeake Executive Council

Federal Facilities Strategy

Chesapeake Bay Program

Agreement Commitment Report

July 1988

ADOPTION STATEMENT

We, the undersigned, adopt the **Federal Facilities Strategy**, in fulfillment of Water Quality Commitment Number 5 of the 1987 Chesapeake Bay Agreement:

> *"...by July 1988, the Environmental Protection Agency, acting for the federal government, will develop, adopt and begin implementation of a strategy for the control and reduction of point and nonpoint sources of nutrient, toxic and conventional pollution from all federal facilities."*

The Federal Facilities Strategy recognizes that all of the federal departments and agencies with real estate in the Bay drainage area have the potential to affect the water quality and living resources of the Bay. The Strategy recognizes further that federal departments will undertake initiatives to restore and protect the Bay by initially selecting those facilities which have the greatest potential to affect the Bay and requiring that action plans for these facilities be designed and implemented as the first priority.

The facilities will design and implement abatement programs for point sources, toxicants and nonpoint sources. The last component of the Strategy is a calendar of milestones which has been agreed upon by all federal departments and agencies with facilities on the Bay.

In accepting this Federal Facilities Strategy, we call upon the departments and agencies participating in its implementation to review, evaluate and report annually on the implementation of their plans.

For the Commonwealth of Virginia

For the State of Maryland

For the Commonwealth of Pennsylvania

For the United States of America

For the District of Columbia

For the Chesapeake Bay Commission

NEWS RELEASE

OFFICE OF ASSISTANT SECRETARY OF DEFENSE
(PUBLIC AFFAIRS)
WASHINGTON, D.C. - 20301
PLEASE NOTE DATE

HOLD FOR RELEASE
UNTIL 10 A.M. (EDT)
FRIDAY, APRIL 20, 1990

No. 182-90
(202) 695-0192 (info)
(202) 697-3189 (copies)
(202) 697-5737 (public/industry)

DEFENSE DEPARTMENT AND EPA SIGN NEW AGREEMENT TO RESTORE CHESAPEAKE BAY

Defense Secretary Dick Cheney and Environmental Protection Agency Administrator William Reilly today signed an agreement strengthening a cooperative effort to restore the Chesapeake Bay, through improved pollution prevention practices, better training, regular inspections, and policies that ensure compliance with the President's goal of "no net loss" of wetlands.

Cheney and Reilly signed a tougher version of the agreement governing use of the Bay in a special ceremony at Ft. McNair on the shores of the Potomac River. Ft. McNair, one of 65 major installations maintained by the Defense Department on about 350,000 acres in the Bay watershed, is in full compliance with EPA's pollution control requirements.

The Defense Department will spend about $50 million in Fiscal Year 1990 at military facilities affected by the agreement to improve Bay water quality, reduce pollution, reduce erosion, and manage its resources.

"As a user of the Chesapeake's many resources, the Defense Department has a shared responsibility to restore and protect this national treasure. I want our environmental policies in the Chesapeake Bay area to stand as a model for federal environmental activities everywhere," Cheney said.

"Federal agencies should be role models in the Bay restoration effort," Reilly agreed. "With more than 60 military installations located throughout the watershed, the Department of Defense is a significant presence on the Chesapeake Bay and a major user of its resources. The nation is renewing its commitment to our environment on the 20th anniversary of Earth Day. Secretary Cheney's presence at this ceremony demonstrates the Defense Department's environmental commitment."

The Cooperative Agreement expands the original EPA/DoD agreement signed in September 1984. Under the terms of the new agreement, the Department of Defense will ensure that its facilities on the Chesapeake Bay:

- Work with EPA and the Bay states to ensure full compliance with water quality requirements of the National Pollutant Discharge Elimination System (NPDES) Program and Baywide initiatives to reduce nutrients and toxics.

(more)

- Incorporate pollution prevention practices into their daily activities;

- Fund construction that may be needed to support compliance and other projects identified through initiatives in this agreement;

- Improve the operation and maintenance of wastewater treatment facilities by sending staff to state operator training programs;

- Ensure that new development and construction are consistent with the President's goal of "no net loss" of wetlands; and

- Improve nonpoint source (NPS) control methods to implement best management practices that are consistent with state NPS management programs.

Reilly said that EPA will assist DoD in evaluating the environmental programs of the Bay area defense facilities. Under the terms of the agreement, he said that EPA will also:

- Conduct annual workshops to alert DoD facility managers to new pollution control methods and requirements;

- Meet with DoD officials annually to assess progress and compliance;

- Provide technical advice and assistance, particularly on nonpoint source control, wetlands, and shoreline protection issues;

- Work with states to ensure that all major DoD wastewater discharge permits are issued with appropriate nutrient and toxics controls; and

- Work in partnership with the states to inspect all major Defense NPDES installations;

The new agreement also commits the Defense Department to selecting a facility to serve as a model to field test the use of pollution prevention techniques. The pilot DoD facility is expected to be announced shortly.

Cheney said that the Defense Department is "doing more than updating old policies. The Defense Department is building a new environmental ethic into everything we do. This ethic can be summed up in three words -- compliance, responsibility, and cooperation."

The Defense Department is also planning a series of environmental initiatives in 1990, including special observances of Earth Day. On the agenda are a national forum in June on "Our Nation's Defense and the Environment" and a conference this week in Atlanta on environmental compliance and the environmental challenges of the 1990's.

(end)

THE 1990 EPA/DOD COOPERATIVE AGREEMENT

The EPA/DOD Cooperative Agreement on the Chesapeake Bay was signed by Secretary of Defense Dick Cheney and EPA Administrator William K. Reilly on April 20, 1990.

This Agreement aligns the 1984 Joint Resolution with the goals of the 1987 Chesapeake Bay Agreement. The major provisions of the agreement are as follows:

Participation

- DOD will actively participate in the Federal Agencies Committee and other subcommittees or work groups and identify opportunities to participate in Bay restoration activities.

- DOD will send wastewater treatment plant operators to State Operator Training Programs.

Planning

- DOD will integrate environmental planning requirements identified in the Agreement into the implementation plans of all installations with a potentially significant impact on the Bay that were identified in DOD's water quality assessment study of Bay facilities.

- DOD will integrate the land and living resources management goals of the 1987 Bay Agreement into daily operations at its installations. This will include implementing nonpoint source controls on DOD leased and owned land; sediment and erosion control at construction sites, especially along shorelines; identification and protection of wetlands and submerged aquatic vegetation (SAV) beds; and integrated pest management (IPM) practices.

- DOD will incorporate pollution prevention practices into daily operations, emphasizing source reduction and environmentally sound recycling of materials.

- New development will be sited and constructed to minimize impact on the Bay and ensure that it is consistent with the President's goal of "no net loss" of wetlands.

- DOD activities will be consistent with State Nonpoint Source Management Programs.

FUNDING

- DOD will ensure funding for compliance, pollution abatement and prevention, and natural resources management projects.

Audits and Inspections

- DOD will conduct periodic multi-media environmental audits to assure compliance with all pollution control laws.

- DOD will ensure compliance with all requirements of the National Pollutant Discharge Elimination System (NPDES) Program which regulates the discharge of wastewater to rivers and streams.

EPA will:

- provide technical advice and assistance, particularly on nonpoint source control, wetlands, and shoreline protection,

- work with the States to ensure that all major DOD wastewater discharge permits are issued and have appropriate nutrient and toxics controls,

- work with the States to inspect all major (NPDES) permittees,

- conduct annual workshops for all federal facility coordinators and managers in the Bay region, and

- assess progress and compliance with DOD officials annually.

THE 1984 EPA/DOD JOINT RESOLUTION

The EPA/DOD Joint Resolution on the Chesapeake Bay was signed by then Secretary of Defense Caspar W. Weinberger and EPA Administrator William D. Ruckelhaus on September 13, 1984. It expired on January 1, 1990.

It established the following broad commitments for "pollution abatement" activities:

- DOD agreed to give priority consideration for funding to pollution abatement projects and studies in the Chesapeake Bay.
- As a pilot project, DOD would initiate environmental self-auditing at 14 Bay installations.
- DOD would provide to EPA and the States any information necessary to issue or reissue all major wastewater discharge permits required under the National Pollutant Discharge Elimination System (NPDES) Program.
- DOD would take action to reduce soil erosion and other pollutants from nonpoint sources.
- EPA and the Bay States would issue or reissue all major DOD NPDES permits in the Chesapeake Bay by September 30, 1985.
- EPA and the States would conduct annual inspections of these major installations.
- EPA would provide technical assistance on nonpoint and point source control.

COOPERATIVE AGREEMENT

BETWEEN

DEPARTMENT OF DEFENSE
AND
ENVIRONMENTAL PROTECTION AGENCY
CONCERNING

CHESAPEAKE BAY ACTIVITIES

PREAMBLE

1. The Chesapeake Bay is a national treasure and a resource of worldwide significance. Its ecological, economic, and cultural importance is felt far beyond its waters and the communities that line its shores. In recent decades however, the Bay has suffered serious declines in quality and productivity.

2. The 1987 Chesapeake Bay Agreement between the Environmental Protection Agency (EPA), representing the Federal government, the District of Columbia, the State of Maryland, the Commonwealths of Pennsylvania and Virginia, and the Chesapeake Bay Commission, established a policy to reverse this decline, and a framework for continued cooperative efforts to restore and protect the Chesapeake Bay. It contains goals and priority commitments to achieve these objectives for living resources; water quality; population growth and development; public information, education and participation; public access; and governance.

3. The Department of Defense (DoD) continues its ongoing commitment to protect the environment and the natural resources which have been entrusted to its care, while at the same time accomplishing its primary mission of national defense.

4. DoD maintains over 60 installations in the Chesapeake Bay drainage basin, encompassing approximately 350,000 acres. Recognizing its role as a major Federal user of the land and waters of the Chesapeake Bay region, DoD completed a water quality assessment study to determine the relative impact of its activities on the water quality and living resources of this important estuary.

5. EPA has regulatory responsibility for the control and abatement of pollution in areas of air, water, solid waste, toxic substances, pesticides, noise, and radiation. This includes setting and enforcing environmental standards; conducting research on the

cause, effect, control, and prevention of environmental problems; and assisting State and local cooperators.

6. EPA, in conjunction with Federal, State and local cooperators, has been conducting studies, environmental surveys and assessments and developing strategies for improving and restoring the Chesapeake Bay.

7. DoD and EPA share a mutual interest in restoring and protecting the Chesapeake Bay. The actions carried out under this Agreement will strengthen coordination, increase understanding and action on key environmental issues, and reduce duplication of resources and expertise.

8. Therefore, DoD and EPA agree to cooperate to implement the goals and objectives of the Chesapeake Bay Agreement.

PURPOSE

This Cooperative Agreement establishes a policy of coordination and cooperation between DoD and EPA on Chesapeake Bay activities, consistent with the goals, objectives, and commitments of the 1987 Chesapeake Bay Agreement. It supersedes the September 13, 1984 Joint Resolution between DoD and EPA on pollution abatement in the Chesapeake Bay.

AUTHORITY

1. Executive Order 12088 directs each Executive Agency responsible for compliance with pollution control standards to take necessary actions for prevention, control, and abatement of environmental pollution from activities under its control.

2. EPA has statutory authority (e.g. Section 117, Clean Water Act as Amended) to develop increased Federal participation in cooperative Chesapeake Bay activities. These efforts are supported and encouraged by DoD.

3. Nothing in this Agreement diminishes or expands the administrative authority of each agency in execution of its statutory requirements. The Agreement is intended to facilitate those authorities through cooperative means.

DEFINITIONS

"Exceptions list" and "significant noncompliance (SNC)" as they are defined and used in this agreement are terms that apply to compliance under the requirements of the federal National Pollution Discharge Elimination System (NPDES) program.

The EPA Exceptions List is an internal tracking mechanism used by EPA to track facilities that are chronic noncompliers. It is based on a compilation of major NPDES permit holders that have been in significant noncompliance for two consecutive quarters or more. The Exceptions List is developed quarterly by EPA Region III based on the Quarterly Noncompliance Report (QNCR).

"Major NPDES Permit Holder" is generally defined as a facility that discharges 1 million gallons per day (MGD) or more of wastewater or is rated at 80 or above on the EPA Major Industrial Rating Scale for NPDES Facilities.

Significant Noncompliance (SNC): For purposes of determining SNC, any and all violations which meet the criteria listed in 40 CFR, Section 123.45 for Category I noncompliance and some of the criteria for Category II noncompliance are to be considered in SNC. For a detailed explanation of Category I and II, and SNC refer to 40 CFR, Section 123.45 and to Appendix I of the Guidance for Preparation of Quarterly and Semi-Annual Noncompliance Reports in the Enforcement Management System Guide (September 1989).

RESPONSIBILITIES

IT IS AGREED THAT:

A. The Environmental Protection Agency will:

1. Support DoD membership on the Federal Agencies Coordinating Committee, Implementation Committee, and other Agreement entities as appropriate.

2. Coordinate with DoD concerning the development of programs, technical policies, regulations, guidelines, training, research, demonstrations and pollution prevention initiatives relative to the Chesapeake Bay Program.

3. In cooperation with the delegated States, act to insure the issuance or reissuance of all major and other significant DoD National Pollution Discharge Elimination System (NPDES) permits in the Chesapeake Bay region. These permits will contain requirements (including reducing or eliminating toxic pollutants) appropriate to insure the protection of the waters of the Chesapeake Bay.

4. Provide on-site evaluations of specified programs to DoD installations in the Chesapeake Bay region upon request. EPA and delegated states will inspect DoD facilities for compliance in accordance with appropriate Federal, State and local environmental statutes and regulations. EPA will ensure that annual inspections are conducted by EPA or delegated States for all major NPDES permitees in the Chesapeake Bay Region and that findings are provided to the inspected facility on a timely basis.

5. Provide DoD with technical advice and assistance on controlling nonpoint and other water pollution sources, tidal and nontidal wetlands protection and enhancement, and shoreline protection. Facilitate cooperation with the Soil Conservation Service, the Forest Service, the Fish and Wildlife Service, and the Geological Service in these activities. Technical publications on these subjects will be made available to DoD installations in the Chesapeake Bay region upon request.

6. Conduct annual workshops for all federal facility coordinators and managers in the Chesapeake Bay region. Facilitate DoD participation in EPA on-site Operator Training Programs for wastewater treatment plant operators pursuant to Section 104(g) of the Clean Water Act.

7. Provide access to data in the Chesapeake Bay Program's (CBP) computerized data files. EPA further agrees to provide DoD with appropriate training and assistance in the use of the computer facility to promote DoD's contributions to the Bay's restoration efforts.

8. Provide copies of all documents prepared under the CBP to the Office of the Deputy Assistant Secretary of Defense for Environment, to the Headquarters

offices of the Military Services, and to all DoD installations in the Chesapeake Bay region.

9. Meet with DoD at least annually to review progress and activities in implementing this Agreement and to discuss the compliance status of DoD facilities in the Chesapeake Bay Region.

10. Assist the Military Services and DoD installations in developing their public information programs on Chesapeake Bay issues.

11. Coordinate SARA Title III requirements with Federal facilities in the Chesapeake Bay basin as called for in the basin-wide Toxics Reduction Strategy.

B. The Department of Defense will:

Participation

1. Continue to actively participate in the Chesapeake Bay Program (CBP) through central coordination of all related activities. The designated representative of the Secretary of Defense will represent the interests of DoD on the Implementation Committee.

   (a) DoD will provide annually an updated list of Commanders' addresses and telephone numbers for all facilities listed in attachment C.

   (b) DoD representatives will also actively participate on the Federal Agencies Committee and other subcommittees or work groups as appropriate.

   (c) DoD installations will enhance internal communications on the Chesapeake Bay cleanup program by actively promoting knowledge of and participation in CBP restoration efforts.

   (d) DoD installations will cooperate with state, regional, local and other Federal agencies through the CBP and other coordination mechanisms to identify separate and joint opportunities for Bay restoration activities. DoD will evaluate its programs with other agencies on a continuing basis to improve

effectiveness of Chesapeake Bay activities within its existing programs of natural resources conservation and environmental quality management.

(e) DoD installations will ensure that their wastewater treatment plant operators will receive adequate training and proper certifications through EPA/State On-site Operator Training Programs or other means as appropriate.

2. Support achieving goals and commitments made in Nutrient, Toxics, and Conventional Pollutant Control Strategies, including coordination with EPA regarding SARA Title III requirements for Federal facilities in the basin.

Planning

3. Develop, and review annually, implementation plans for all installations identified in DoD's water quality assessment study as having a significant impact potential on the Chesapeake Bay consistent with the Chesapeake Bay Federal Facilities Strategy. (Appendix A and B). Ensure such plans integrate other environmental planning requirements provided for under this Agreement. Provide copies of plans to EPA and affected states upon request.

4. Integrate at all facilities listed in Appendix C CBP goals and concerns into DoD's existing integrated natural resources management plans and practices, including:

(a) Implement best management practices (BMPs) for nonpoint source pollution control on leased farmland, commercial forest land, and on all other DoD lands.

(b) Remove impediments to passage of migratory fishes in the Chesapeake Bay watershed.

(c) Identify, protect, enhance, restore, and create wetlands.

(d) Cooperate with other agencies to identify and protect existing submerged aquatic vegetation (SAV) beds.

(e) Control sediment and erosion at Defense construction sites.

(f) Control shoreline erosion and sedimentation.

(g) Maintain integrated pest management (IPM) practices for all pest control operations on DoD lands.

(h) Maintain and enhance waterfowl and wildlife habitat.

5. (a) Incorporate the practice of pollution prevention into the policies, program procedures and operations of DoD's Chesapeake Bay facilities policies, program procedures and operations of DoD's Chesapeake Bay facilities through implementation of an environmental management hierarchy which emphasizes pollution prevention through source reduction first and then environmentally-sound recycling of materials that cannot be reduced, avoided or eliminated.

(b) Select a DoD installation within the Chesapeake Bay Region to serve as a model community to demonstrate how pollution prevention techniques can be combined into an integrated pollution prevention plan.

6. Identify environmental projects (e.g. evaluation of biological nutrient removal techniques or the use of wetlands as nutrient reduction methods, testing of stormwater runoff control techniques, shoreline erosion control measures, agricultural practices on outlease areas) as potential demonstration projects for EPA or State programs.

7. Design, locate, and construct new development in a manner that will minimize its impact on the Chesapeake Bay and its tributaries, and in consonance with the President's goal of no net loss of wetlands.

8. Ensure that DoD projects and activities at facilities listed in Appendix B do not conflict with policies, standards and activities in the States' Nonpoint Source Management Programs

pursuant to the Federal consistency provision in Section 319 of the Clean Water Act.

Funding

9. Ensure funding is obtained by the most expeditious means possible for pollution abatement and prevention projects and studies needed for those facilities on the EPA Exceptions List or in significant noncompliance or whenever necessary to meet final effluent limits.

   (a) Review and fund major pollution abatement project design, construction, operation, prevention, and maintenance management practices to ensure their effectiveness in protecting the Chesapeake Bay and its tributaries.

   (b) Give appropriate consideration to other pollution abatement and prevention projects and to natural resources management projects required to meet the objectives of this Agreement.

   (c) Make maximum use of the OMB Circular A-106 process to integrate compliance objectives, funding and coordination with EPA.

Audits and Inspections

10. Conduct periodic multi-media environmental audits (as defined by EPA) at all major (Appendix A) DoD facilities in the Chesapeake Bay Region on a regular ongoing basis and make the results and audit findings available to EPA and the states. Audits will be conducted in a manner consistent with the EPA Generic Protocol for Environmental Audits at Federal Facilities.

11. Take all appropriate actions necessary to ensure compliance with all provisions of NPDES permits, with special attention to effluent limits, all chemical and/or biological toxics monitoring programs and pretreatment requirements. Ensure that all Discharge Monitoring Reports required by NPDES permits are complete and submitted to EPA within the time frame required by the permit.

12. Continue to provide information to EPA or the States necessary to issue or reissue all major National Pollutant Discharge Elimination System (NPDES) wastewater discharge permits.

13. Ensure future water quality monitoring results are in a form compatible with the CBP's data base, and forward results to appropriate offices on a timely basis.

14. Meet with EPA at least annually to report on progress and activities in implementing this agreement and to discuss the compliance status of DoD facilities.

DELEGATION

Authorized representatives of EPA and DoD may enter into supplemental agreements within the scope of this document.

MODIFICATION AND TERMINATION

This Agreement may be modified or amended upon request of either party and the concurrence of the other. The Agreement may be terminated with 60-day notice of either party.

IMPLEMENTATION

This Agreement becomes effective when signed by both parties and shall remain in effect until modified or terminated.

Department of Defense
Secretary of Defense

Date: 4/20/90

Environmental Protection Agency
Administrator

Date: April 20, 1990

APPENDIX A

DoD Installations in the Chesapeake Bay Region
with NPDES permits 1.0 MGD or greater.

Aberdeen Proving Ground (Aberdeen and Edgewood Areas), MD
Army Corps of Engineers Washington Aqueduct-Dalecarlia Plant, DC
David W. Taylor NSRDC - Annapolis, MD
Fort Deitrick, MD
Fort Eustis, VA
Fort George G. Meade, MD
Letterkenny Army Depot, PA
Naval Air Station/Naval Air Test Center - Patuxent River, MD
Naval Base - Norfolk, VA
Naval Base Supply Center - Norfork, VA
Naval Ordnance Station - Indian Head, MD
Naval Shipyard - Norfolk, VA
Naval Surface Weapons Center - White Oak, MD
U.S. Marine Corps - Quantico, VA

APPENDIX B

DoD Installations in the Chesapeake Bay Region with a Significant Impact Potential on the Bay's Water Quality

Aberdeen Proving Ground (Aberdeen and Edgewood Areas)
Allegheny Ballistics Lab
Andrews Air Force Base
Defense General Supply Center - Richmond
Fort Belvoir
Fort Eustis
Fort George G. Meade
Harry Diamond Lab - Blossom Point
Langley Air Force Base
Letterkenny Army Depot
Naval Air Station - Oceana
Naval Air Station/ Naval Air Test Center - Patuxent River
Naval Amphibious Base - Little Creek
Naval Ordnance Station - Indian Head
Naval Shipyard - Norfolk
Naval Supply Center - Cheatham Annex
Naval Supply Center - Craney Island
Naval Supply Center - Yorktown
Naval Surface Weapons Center - Dahlgren
Naval Surface Weapons Center - White Oak
Naval Weapons Station - Yorktown
Navy Ships Part Control Center - Mechanicsburg
Sewells Point Navy Complex (Naval Station, Naval Air Station, Naval Aviation Depot, Public Works Center, Supply Center)
U.S. Marine Corps - Quantico
Vint Hill Farms Station

APPENDIX C

DoD Installations in the Chesapeake Bay Region

AIR FORCE

Andrews Air Force Base, Andrews AFB, MD
Bolling Air Force Base, Washington, DC
Brandywine RDV Site, Brandywine, MD
Davidsonville RDV Site, Davidsonville, MD
Langley Air Force Base, Hampton, VA

ARMY

Aberdeen Proving Ground Complex, Aberdeen, MD
Aberdeen Proving Ground, Aberdeen, MD
Aberdeen Proving Ground, Edgewood, MD
Cameron Station, Alexandria, VA
Carlisle Barracks, Carlisle, PA
Fort A.P. Hill, Bowling Green, VA
Fort Belvoir, Fort Belvoir, VA
Fort Detrick, Frederick, MD
Fort Eustis, Newport News, VA
Fort Lee, Fort Lee, VA
Fort McNair, Washington, DC
Fort Meade, Fort Meade, MD
Fort Monroe, Fort Monroe, VA
Fort Myer, Arlington, VA
Fort Ritchie, Fort Ritchie, MD
Fort Stony, Virginia Beach, VA
Harry Diamond Lab-Adelphi, MD
Harry Diamond Labs-Blossom Point, MD
Harry Diamond Labs-Woodbridge, Woodbridge, VA
Letterkenny Army Depot, Chambersburg, PA
New Cumberland Army Depot, New Cumberland, PA
Vint Hill Farms Station, Warrenton, VA
Walter Reed Army Medical Center, Silver Spring, MD

DEFENSE LOGISTICS AGENCY

Defense General Supply Center, Richmond, VA

NAVY

Allegheny Ballistics Lab-Plant L. Rocket Center, WV
David W. Taylor NSRDC-Annapolis, Annapolis, MD
David W. Taylor NSRDC-Bethesda, Bethesda, MD
Sewell's Point Navy Complex, Norfolk, VA
Naval Aviation Depot, Norfolk, VA
Naval Air Station-Norfolk, Norfolk, VA

APPENDIX C

DoD Installations in the Chesapeake Bay Region

AIR FORCE

Andrews Air Force Base, Andrews AFB, MD
Bolling Air Force Base, Washington, DC
Brandywine RDV Site, Brandywine, MD
Davidsonville RDV Site, Davidsonville, MD
Langley Air Force Base, Hampton, VA

ARMY

Aberdeen Proving Ground Complex, Aberdeen, MD
Aberdeen Proving Ground, Aberdeen, MD
Aberdeen Proving Ground, Edgewood, MD
Cameron Station, Alexandria, VA
Carlisle Barracks, Carlisle, PA
Fort A.P. Hill, Bowling Green, VA
Fort Belvoir, Fort Belvoir, VA
Fort Detrick, Frederick, MD
Fort Eustis, Newport News, VA
Fort Lee, Fort Lee, VA
Fort McNair, Washington, DC
Fort Meade, Fort Meade, MD
Fort Monroe, Fort Monroe, VA
Fort Myer, Arlington, VA
Fort Ritchie, Fort Ritchie, MD
Fort Stony, Virginia Beach, VA
Harry Diamond Lab-Adelphi, MD
Harry Diamond Labs-Blossom Point, MD
Harry Diamond Labs-Woodbridge, Woodbridge, VA
Letterkenny Army Depot, Chambersburg, PA
New Cumberland Army Depot, New Cumberland, PA
Vint Hill Farms Station, Warrenton, VA
Walter Reed Army Medical Center, Silver Spring, MD

DEFENSE LOGISTICS AGENCY

Defense General Supply Center, Richmond, VA

NAVY

Allegheny Ballistics Lab-Plant L. Rocket Center, WV
David W. Taylor NSRDC-Annapolis, Annapolis, MD
David W. Taylor NSRDC-Bethesda, Bethesda, MD
Sewell's Point Navy Complex, Norfolk, VA
Naval Aviation Depot, Norfolk, VA
Naval Air Station-Norfolk, Norfolk, VA

Naval Station-Norfolk, Norfolk, VA
Naval Supply Center-Norfolk, Norfolk, VA
Public Works Center-Norfolk, Norfolk, VA
Naval Air Station-Oceana, Virginia Beach, VA
Naval Air Station, Patuxent River Complex, Lexington Park, MD
Naval Air Station, Lexington Park, MD
Naval Air Test Center, Lexington Park, MD
Naval Air Station-Solomons Annex, Solomons, MD
Naval Amphibious Base-Little Creek, Norfolk, VA
Naval Communications Unit, Cheltenham, MD
Naval Electronic Systems Engineering Activity, St. Inigoes, MD
Naval Medical Command-National Capital Region, Bethesda, MD
Naval Observatory, Washington, DC
Naval Ordnance Station, Indian Head, MD
Naval Radio Station-Sugar Grove, Sugar Grove, WV
Naval Radio Transmitter Facility, Annapolis, MD
Naval Research Lab, Washington, DC
Naval Research Lab-Chesapeake Bay Detachment, Randle Cliff Beach, MD
Naval Shipyard-Norfolk, Portsmouth, VA
Naval Station-Annapolis, Annapolis, MD
Naval Supply Center-Cheatham Annex, Williamsburg, VA
Naval Supply Center-Craney Island, Portsmouth, VA
Naval Supply Center-Yorktown, Yorktown, VA
Naval Surface Weapons Center-Dahlgren, Dahlgren, VA
Naval Surface Weapons Center-White Oak, Silver Spring, MD
Naval Weapons Station, Yorktown, VA
Navy Ships Parts Control Center, Mechanicsburg, PA
St. Juliens Creek Annex, Portsmouth, VA
U.S. Marine Corps-Quantico, Quantico, VA
U.S. Naval Academy, Anr polis, MD
U.S. Naval Academy Farm, Gambrills, MD
Washington Navy Yard, Washington, DC

THE WHITE HOUSE

WASHINGTON

April 18, 1990

I am happy to send my greetings to all those assembled for the signing of the Chesapeake Bay Cooperative Agreement between the Department of Defense and the Environmental Protection Agency. My thanks to Secretary Cheney, Administrator Reilly, and their staffs for working so hard to make this ceremony possible.

The Chesapeake Bay is a vital natural resource for the Middle Atlantic region. Thousands of citizens rely on it for commerce and recreation. This important agreement reaffirms my Administration's commitment to protecting our environment, and it will play an important role in continuing efforts to improve the water quality of the Chesapeake Bay.

With almost 60 installations located in the Bay area and along its tributaries, the Department of Defense maintains a significant presence, and I commend its efforts to cooperate with the Environmental Protection Agency in environmental restoration and protection. The pollution abatement projects you have begun will lessen the effect of military operations on the Bay's fragile ecosystem and help to preserve the Chesapeake Bay for generations to come.

Barbara joins me in sending our best wishes for a memorable ceremony and for the successful implementation of your Cooperative Agreement.

George Bush

MEMORANDUM OF UNDERSTANDING
BETWEEN THE
U.S. ARMY CORPS OF ENGINEERS (COE)
AND THE
U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)

I. Purposes

This memorandum of understanding establishes the participation of the U.S. Army Corps of Engineners (COE) in the management of the Chesapeake Bay Program (CBP). It reflects the mutual desire that the capabilities of the COE in their areas of expertise contribute to a coordinated effort toward protection and restoration of the Chesapeake Bay environment.

II. Understandings

A. COE Participation in CBP Coordinative Structure

COE will participate actively in the management structure of the Chesapeake Bay Program (CBP). The Baltimore District will represent the COE on the Implementation Committee. Appropriate representatives will serve on the various subcommittees. COE personnel will participate in additional activities as needed to fulfill the COE's part in the Chesapeake Bay Program.

B. COE Participation in the Chesapeake Bay Program

EPA and COE will cooperate in those areas where there .. a mutual interest. EPA recognizes the expertise of the COE in the planning, design, and construction of water resource development projects for flood control, navigation, water management, and erosion control devices. The COE also has expertise in development of models and monitoring programs.

CBP recognizes the role that the COE will play in a number of areas including:

1. COE will cooperate with states, EPA, NOAA, USDA, and Fish and Wildlife Service through participation on committees established by the CBP in assisting in the identification of priority research modeling and monitoring needs. Through this mechanism, the potential for joint funding of projects relative to the Bay clean-up effort will also be identified.

2. COE will cooperate with states, EPA, NOAA, USDA, and Fish and Wildlife Service to evaluate the District level programs and make recommendations for possible modifications to improve effectiveness within the existing national COE framework.

3. During the conduct of the recently authorized Chesapeake Bay Erosion Control Study, the COE will actively coordinate with the state and Federal agencies during development and execution of the study. It is recognized that there is currently available data on erosion in the form of aerial photography from other Federal agencies as well as the states.

Development of additional data will take full advantage of that which is presently available. In addition, data collection activities will be coordinated with other agencies.

4. The COE will continue to coordinate its annual maintenance dredging program with the state and Federal agencies so as to develop disposal plans that are technically and environmentally acceptable.

5. COE will participate (in conjunction with other agencies) in public awareness programs to acquaint citizens with Chesapeake Bay-related issues.

C. COE recognizes the role of EPA as the lead agency for Federal participation in the CBP. The COE will assist in developing increased Federal participation in cooperative Chesapeake Bay activities, particularly those within the COE that are authorized and funded. The COE will provide other support to the extent that such activities do not hinder its Federally mandated responsibilities.

III. Authorities

Nothing in this memorandum of understanding alters the statutory authorities and responsibilities of the COE. It is intended to facilitate those authorities through the cooperative mechanisms of the CBP.

William Ruckelshaus
U.S. Environmental Protection Agency

Date Nov 21 1984

Martin W. Walsh, Jr.
U.S. Corps of Engineers

Date 21 Nov 84

THE CHESAPEAKE BAY IS A NATIONAL TREASURE and a resource of worldwide significance. Its ecological, economic, and cultural importance are felt far beyond its waters and the communities that line its shores. Man's use and abuse of its bounty, however, together with the continued growth and development of population in its watershed, have taken a toll on the Bay system. In recent decades, the Bay has suffered serious declines in quality and productivity. ◊ *REPRESENTING* the Federal government and the States which surround the Chesapeake Bay, we acknowledge our stake in the resources of the Bay and accept our share of responsibility for its current condition. We are determined that this decline will be reversed. In response, all of our jurisdictions have embarked on ambitious programs to protect our shared resource and restore it to a more productive state. ◊ *IN* 1980, the legislatures of Virginia and Maryland established the Chesapeake Bay Commission to coordinate interstate planning and programs from a legislative perspective. In 1985, Pennsylvania joined the Commission. And, in 1983, Virginia, Maryland, Pennsylvania, the District of Columbia, the U.S. Environmental Protection Agency and the Chesapeake Bay Commission formally agreed to a cooperative approach to this undertaking and established specific mechanisms for its coordination. Since 1983, our joint commitment has carried us to new levels of governmental cooperation and scientific understanding. It has formed a firm base for the future success of this long-term program. The extent and complexity of our task now call for an expanded and refined agreement to guide our efforts toward the twenty-first century. ◊ *RECOGNIZING* that the Chesapeake Bay's importance transcends regional boundaries, we commit to managing the Chesapeake Bay as an integrated ecosystem and pledge our best efforts to achieve the goals in this Agreement. We propose a series of objectives that will establish a policy and institutional framework for continued cooperative efforts to restore and protect Chesapeake Bay. We further commit to specific actions to achieve those objectives. The implementation of these commitments will be reviewed annually and additional commitments developed as needed.

GOALS AND PRIORITY COMMITMENTS

THIS NEW AGREEMENT CONTAINS Goals and Priority Commitments for Living Resources, Water Quality, Population Growth and Development, Public Information, Education and Participation, Public Access, and Governance ◊ The parties to this 1987 Agreement are the U.S. Environmental Protection Agency representing the Federal government, the District of Columbia, the State of Maryland and the Commonwealths of Pennsylvania and Virginia (hereinafter the "States") and the Chesapeake Bay Commission. This Agreement may be amended and attachments added in the future by unanimous action of the Chesapeake Executive Council.

LIVING RESOURCES

GOAL: *PROVIDE FOR THE RESTORATION AND PROTECTION OF THE LIVING RESOURCES, THEIR HABITATS AND ECOLOGICAL RELATIONSHIPS.* The productivity, diversity and abundance of living resources are the best ultimate measures of the Chesapeake Bay's condition. These living resources are the main focus of the restoration and protection effort. Some species of shellfish and finfish are of immense commercial and recreational value to man. Others are valuable because they are part of the vast array of plant and animal life that make up the Chesapeake Bay ecosystem on which all species depend. We recognize that the entire natural system must be healthy and productive. We will determine the essential elements of habitat and environmental quality necessary to support living resources and will see that these conditions are attained and maintained. We will also manage the harvest of and monitor populations of commercially, recreationally and ecologically valuable species to ensure sustained, viable populations. We recognize that to be successful, these actions must be carried out in an integrated and coordinated manner across the whole Bay system.

OBJECTIVES:

- ◇ Restore, enhance, protect and manage submerged aquatic vegetation.
- ◇ Protect, enhance and restore wetlands, coastal sand dunes, forest buffers and other shoreline and riverline systems important to water quality and habitat.
- ◇ Conserve forest resources and reduce erosion and sedimentation to protect Bay resources.
- ◇ Maintain adequate flow regimes necessary to sustain estuarine habitat and, where appropriate, establishing minimum instream flows.
- ◇ Develop and implement Bay-wide stock assessment programs.
- ◇ Develop Bay-wide fisheries management strategies and develop complementary state programs and plans to protect and restore the finfish and shellfish stocks of the Bay, especially the freshwater and estuarine spawners.
- ◇ Provide for the restoration of shellfish stocks in the Bay, especially the abundance of commercially important species.
- ◇ Restore, enhance and protect waterfowl and wildlife.

COMMITMENT:

TO ACHIEVE THIS GOAL WE AGREE:

- ◇ by *January 1988*, to develop and adopt guidelines for the protection of water quality and habitat conditions necessary to support the living resources found in the Chesapeake Bay system, and to use these guidelines in the implementation of water quality and habitat protection programs.
- ◇ by *July 1988*, to develop, adopt and begin to implement a Bay-wide plan for the assessment of commercially, recreationally and selected ecologically valuable species.
- ◇ by *July 1988*, to adopt a schedule for the development of Bay-wide resource management strategies for commercially, recreationally and selected ecologically valuable species.
- ◇ by *July 1989*, to develop, adopt and begin to implement Bay-wide management plans for oysters, blue crabs and American Shad. Plans for other major commercially, recreationally and ecologically valuable species should be initiated by 1990.
- ◇ by *December 1988*, to develop a Bay-wide policy for the protection of tidal and non-tidal wetlands.
- ◇ Provide for fish passage at dams, and remove stream blockages wherever necessary to restore natural passage for migratory fish.

WATER QUALITY

GOAL: *REDUCE AND CONTROL POINT AND NONPOINT SOURCES OF POLLUTION TO ATTAIN THE WATER QUALITY CONDITION NECESSARY TO SUPPORT THE LIVING RESOURCES OF THE BAY.* The improvement and maintenance of water quality are the single most critical elements in the overall restoration and protection of the Chesapeake Bay. Water is the medium in which all living resources of the bay live, and their ability to survive and flourish is directly dependent on it. ◊ To ensure the productivity of the living resources of the Bay, we must clearly establish the water quality conditions they require and must then attain and maintain those conditions. Foremost, we must improve or maintain dissolved oxygen concentrations in the Bay and its tributaries through a continued and expanded commitment to the reduction of nutrients from both point and nonpoint sources. We must do the same for toxics and conventional pollutants. To be effective, we will develop basin-wide implementation plans for the control and reduction of pollutants which are based on our best understanding (including that derived from modeling) of the Bay and its tributaries as an integrated system.

OBJECTIVES:

◊ Promote timely construction and maintenance of public and private wastewater facilities to assure control of pollutant discharges.

◊ Minimize the discharge of untreated or inadequately treated sewage to Bay waters from such sources as combined sewer overflows, leaking sewage systems, and failing septic systems.

◊ Evaluate and institute, where appropriate, alternative technologies for point source pollution control, such as biological nutrient removal and land application of effluent to reduce pollution loads in a cost-effective manner.

◊ Establish and enforce pollutant limitations to ensure compliance with water quality laws.

◊ Reduce the levels of nonpoint sources of pollution.

◊ Reduce sedimentation by strengthening enforcement of existing erosion control regulations.

◊ Eliminate pollutant discharges from recreational boats.

◊ Identify and control toxic discharges to the Bay system, including metals and toxic organics, to protect water quality, aquatic resources and human health through implementation and enforcement of the states' National Pollutant Discharge Elimination System permit programs and other programs.

◊ Reduce chlorine discharges in critical finfish and shellfish areas. Minimize water pollution incidents and provide adequate response to pollutant spills.

◊ Manage sewage sludge, dredged spoil and hazardous wastes to protect the Bay system.

◊ Manage groundwater to protect the water quality of the Bay.

◊ Quantify the impacts and identify the sources of atmospheric inputs on the Bay system.

COMMITMENT:

TO ACHIEVE THIS GOAL WE AGREE:

◊ by *July 1988*, to develop, adopt and begin implementation of a basin-wide strategy to equitably achieve by the year 2000 at least a 40 percent reduction of nitrogen and phosphorus entering the main stem of the Chesapeake Bay. The strategy should be based on agreed upon 1985 point source loads and on nonpoint loads in an average rainfall year.

◊ by *December 1991*, to re-evaluate the 40 percent reduction target based on the results of modeling, research, monitoring and other information available at that time.

◊ by *December 1988*, to develop, adopt and begin implementation of a basin-wide strategy to achieve a reduction of toxics consistent with the Water Quality Act of 1987 which will ensure protection of human health and living resources. The strategy will cover both point and nonpoint sources, monitoring protocols, enforcement of pretreatment regulations and methods for dealing with in-place toxic sediments where necessary.

◊ by *July 1988*, to develop and adopt, as required by the Water Quality Act of 1987, a basin-wide implementation strategy for the management and control of conventional pollutants entering the Chesapeake Bay system from point and nonpoint sources.

◊ by *July 1988*, the Environmental Protection Agency, acting for the federal government, will develop, adopt and begin implementation of a strategy for the control and reduction of point and nonpoint sources of nutrient, toxic and conventional pollution from all federal facilities.

POPULATION GROWTH AND DEVELOPMENT

GOAL: *PLAN FOR AND MANAGE THE ADVERSE ENVIRONMENTAL EFFECTS OF HUMAN POPULATION GROWTH AND LAND DEVELOPMENT IN THE CHESAPEAKE BAY WATERSHED.* There is a clear correlation between population growth and associated development and environmental degradation in the Chesapeake Bay system. Enhancing, or even maintaining, the quality of the Bay while accommodating growth will frequently involve difficult decisions and restrictions and will require continued and enhanced commitment to proper development standards. The states and the federal government will assert the full measure of their authority to mitigate the potential adverse effects of continued growth. Local jurisdictions have been delegated authority over many decisions regarding growth and development which have both direct and indirect effects on the Chesapeake Bay system and its living resources. The role of local governments in the restoration and protection effort will be given proper recognition and support through state and federal resources. ◇ States will engage in an active partnership with local governments to establish policy guidelines to manage growth and development.

OBJECTIVES:

- ◇ Designate a state-level office responsible for ensuring consistency with this Agreement among the agencies responsible for comprehensive oversight of development activity, including infrastructure planning, capital budgets, land preservation and waste management activities.
- ◇ Provide local governments with financial and technical assistance to continue and expand their management efforts.
- ◇ Consult with local government representatives in the development of Chesapeake Bay restoration and protection plans and programs.
- ◇ Identify and give public recognition to innovative and otherwise noteworthy examples of local government restoration and protection-related programs.
- ◇ Assure that government development projects meet all environmental requirements.
- ◇ Promote, among local, state and federal governments, and the private sector, the use of innovative techniques to avoid and, where necessary, mitigate the adverse impacts of growth.

COMMITMENT:

TO ACHIEVE THIS GOAL WE AGREE:

- ◇ to commission a panel of experts to report, by *December 1988*, on anticipated population growth and land development patterns in the Bay region through the year 2020, the infrastructure requirements necessary to serve growth and development, environmental programs needed to improve Bay resources while accommodating growth, alternative means of managing and directing growth and alternative mechanisms for financing governmental services and environmental controls. The panel of experts will consist of twelve members: three each from Virginia, Maryland and Pennsylvania, and one each from the District of Columbia, Environmental Protection Agency and the Chesapeake Bay Commission.
- ◇ by *January 1989*, to adopt development policies and guidelines designed to reduce adverse impacts on the water quality and living resources of the Bay, including minimum best management practices for development and to cooperatively assist local governments in evaluating land-use and development decisions within their purview, consistent with the policies and guidelines.
- ◇ to evaluate state and federal development projects in light of their potential impacts on the water quality and living resources of the Chesapeake Bay, and design and carry out each state and federal development project so as to serve as a model for the private sector in terms of land-use practices.
- ◇ by *December 1988*, to develop a strategy to provide incentives, technical assistance and guidance to local governments to actively encourage them to incorporate protection of tidal and non-tidal wetlands and fragile natural areas in their land-use planning, water and sewer planning, construction and other growth-related management processes.

PUBLIC INFORMATION, EDUCATION AND PARTICIPATION

GOAL: *PROMOTE GREATER UNDERSTANDING AMONG CITIZENS ABOUT THE CHESAPEAKE BAY SYSTEM, THE PROBLEMS FACING IT AND POLICIES AND PROGRAMS DESIGNED TO HELP IT, AND TO FOSTER INDIVIDUAL RESPONSIBILITY AND STEWARDSHIP OF THE BAY'S RESOURCES.*

GOAL: *PROVIDE INCREASED OPPORTUNITIES FOR CITIZENS TO PARTICIPATE IN DECISIONS AND PROGRAMS AFFECTING THE BAY.* The understanding and support of the general public and interest groups are essential to sustaining the long-term commitment to the restoration and protection of the Chesapeake Bay system and its living resources. Citizens must have opportunities to learn about that system and associated management policies and programs and must be given opportunities to contribute ideas about how best to manage that natural system.

OBJECTIVES

- ◊ Provide timely information on the progress of the restoration program.
- ◊ Assure a continuing process of public input and participation in policy decisions affecting the Bay.
- ◊ Enhance Bay-oriented education opportunities to increase public awareness and understanding of the Bay system.
- ◊ Provide curricula and field experiences for students.
- ◊ Promote opportunities to involve citizens directly in Bay restoration efforts.
- ◊ Coordinate the production and distribution of Bay information and education materials.

COMMITMENT:

TO ACHIEVE THESE GOALS WE AGREE:

- ◊ to conduct coordinated education and information programs to inform the general public, local governments, business, students, community associations and others of their roles, responsibilities and opportunities in the restoration and protection effort, and to promote public involvement in the management and decision-making process.
- ◊ to provide for public review and comment on all implementation plans developed pursuant to this agreement.
- ◊ by *March 1988*, to develop state and federal communication plans for public information, education and participation, and by *May 1988*, to develop a unified, Bay-wide communication plan.
- ◊ to promote Chesapeake Bay restoration efforts by establishing an annual Bay-wide series of Chesapeake Bay Watershed Awareness events, to include a Governor's Cup Fishing Tournament.

PUBLIC ACCESS

GOAL: *PROMOTE INCREASED OPPORTUNITIES FOR PUBLIC APPRECIATION AND ENJOYMENT OF THE BAY AND ITS TRIBUTARIES.* Interest in and commitment to the Chesapeake Bay and its tributaries are greatly affected by personal contact with that natural system. Consequently, improved opportunities for access to the shores and waters of the system are essential if public awareness and support are to be maintained and increased.

OBJECTIVES

- ◊ Improve and maintain access to the Bay including public beaches, parks and forested lands.
- ◊ Improve opportunities for recreational and commercial fishing.
- ◊ Secure shoreline acreage to maintain open space and provide opportunities for passive recreation.
- ◊ Secure necessary acreage to protect unique habitat and environmentally sensitive areas.

COMMITMENT:

TO ACHIEVE THIS GOAL WE AGREE:

- ◊ to intensify our efforts to improve and expand public access opportunities being made available by the federal government, the states, and local governments, by developing a strategy, which includes an inventory of current access opportunities by *July 1988*, which targets state and federal actions to secure additional tidal shorefront acres by *December 1990* along the Bay and its tributaries.
- ◊ by *December 1988*, to prepare a comprehensive guide to access facilities and the natural resource system for the tidal Chesapeake Bay.

GOVERNANCE

GOAL: *SUPPORT AND ENHANCE THE PRESENT COMPREHENSIVE, COOPERATIVE AND COORDINATED APPROACH TOWARD MANAGEMENT OF THE CHESAPEAKE BAY SYSTEM*

GOAL: *PROVIDE FOR CONTINUITY OF MANAGEMENT EFFORTS AND PERPETUATION OF COMMITMENTS NECESSARY TO ENSURE LONG-TERM RESULTS.*

The cooperation necessary to sustain an effective Chesapeake Bay restoration and protection effort requires a formal working arrangement involving the states and the federal government. That institutional arrangement must allow for and promote voluntary individual actions coordinated within a well-defined context of the individual responsibilities and authorities of each state and the federal government. It must also ensure that actions which require a concerted, Bay-wide approach be addressed in common and without duplication. One of the principal functions of the coordinating institution is to develop strategic plans and oversee their implementation, based on advice from the public, from the scientific community and from user groups. ◇ In addition, the coordinating body must exert leadership to marshal public support, and it must be accountable for progress made under the terms of this agreement. The coordinating body will continue to be called the Chesapeake Executive Council. The Chesapeake Executive Council shall be comprised of the Governors, the Mayor of the District of Columbia, the Administrator of the Environmental Protection Agency, and the Chairman of the Chesapeake Bay Commission. The chairmanship of the Council shall rotate annually as determined by the Council. The term of the Chairman shall be one year. The Administrator of the Environmental Protection Agency shall represent the federal government, and the Chairman of the Chesapeake Bay Commission shall represent its members.

OBJECTIVES

- ◇ Continue to demonstrate strong, regional leadership by convening an annual public meeting of the Chesapeake Executive Council.
- ◇ Continue to support the Chesapeake Executive Council and provide for technical and public policy advice by maintaining strong advisory committees.
- ◇ Coordinate Bay management activities and develop and maintain effective mechanisms for accountability.
- ◇ The Chesapeake Bay Liaison Office shall provide staff support to the Chesapeake Executive Council by providing analyses and data management, and by generating reports related to the overall program. The Implementation Committee shall provide guidance to the CBLO Director in all matters relating to support for the Council and their supporting committees, subcommittees and work groups including the development of all plans and other documents associated with the Council.
- ◇ Examine the feasibility of joint funding support of the Chesapeake Bay Liaison Office.
- ◇ Track and evaluate activities which may affect estuarine water quality and resources and report at least annually.
- ◇ Develop and maintain a coordinated Chesapeake Bay data management system.
- ◇ Continue to implement a coordinated Bay-wide monitoring system and to develop a Bay-wide living resources monitoring system.
- ◇ Develop and implement a coordinated Bay-wide research program.

COMMITMENT:

TO ACHIEVE THESE GOALS WE AGREE:

- ◇ to develop an annual Chesapeake Bay work plan endorsed by the Chesapeake Executive Council.
- ◇ to continue to support Bay-wide environmental monitoring and research to provide the technical and scientific information necessary to support management decisions.
- ◇ to strengthen the Chesapeake Bay Liaison Office by assigning, as appropriate, staff persons from each jurisdiction and from participating federal agencies to assist with the technical support functions of that office.
- ◇ by *July 1988*, to develop and adopt a comprehensive research plan to be evaluated and updated annually to address the technical needs of the Chesapeake Bay Program.
- ◇ by *July 1988*, develop a Bay-wide monitoring plan for selected commercially, recreationally and ecologically valuable species.
- ◇ by *March 1988*, to establish a local government advisory committee to the Chesapeake Executive Council and charge that committee to develop a strategy for local government participation in the Bay program.
- ◇ to consider and review the feasibility of establishing an independent Chesapeake Bay Executive Board.
- ◇ by *July 1988*, the Environmental Protection Agency, acting for the federal government, will develop, a coordinated, federal agency workplan which identifies specific federal programs to be integrated into a coordinated federal effort to support the restoration of the Chesapeake Bay.

BY THIS AGREEMENT we reaffirm our commitment to restore and protect the ecological integrity, productivity and beneficial uses of the Chesapeake Bay system. We agree to report in *January 1989* on progress made in fulfilling the commitments in this agreement, and to consider at that time additional commitments. The implementation strategies which will be developed pursuant to this agreement will be appended as annexes, and annual reports will include an accounting of progress made on each strategy.

December 15, 1987
(Date)

FOR THE COMMONWEALTH OF VIRGINIA

Gerald L. Baliles

FOR THE STATE OF MARYLAND

William Donald Schaefer

FOR THE COMMONWEALTH OF PENNSYLVANIA

Robert P. Casey, Governor

FOR THE UNITED STATES OF AMERICA

FOR THE DISTRICT OF COLUMBIA

Marion Barry, Mayor

FOR THE CHESAPEAKE BAY COMMISSION

Kenneth C. Cole

AN ENDORSEMENT

Anonymous / Baltimore Savings Company, Agents for Mayflower Van Lines / Bell Nursery and Conservation Plantings / Elizabeth Bobbitt / Camden Associates / The Chesapeake Bay Foundation / Citizens Program for The Chesapeake Bay / Conoco Coastal Petroleum Corporation / Fiedler's Seafood / A. M. Fleming Company / First National Bank of Maryland / Harbor Court Hotel / Homewood Gardens / Hyatt Regency Hotel / IBM Business Systems (A Kodak Company) / The Maryland Waterman's Association, Inc. / Naval Academy Band Commercial Unit / Peck's Seafood / The Ward Foundation / F. E. Worthington, Inc.

The columns preceding signatures on this page were sponsored by First National Bank of Maryland. The signatures were sponsored by Conoco Coastal Petroleum Corporation and by Bell Nursery and Conservation Plantings.