NATIONAL PARK SERVICE
U.S. DEPARTMENT OF THE INTERIOR

Baltimore-Washington Parkway
Washington, D.C., Maryland

GRANTING OF RIGHT OF WAY ACCESS BY NATIONAL PARK SERVICE TO ANNE ARUNDEL COUNTY, MARYLAND FOR THE INSTALLATION OF UTILITIES BENEATH THE BALTIMORE-WASHINGTON PARKWAY AT THE MARYLAND ROUTE 198 INTERCHANGE AND FOR THE ACQUISITION OF ADDITIONAL PROTECTIONS FOR THE PARKWAY AND PATUXENT RESEARCH REFUGE

LAUREL, MARYLAND

ENVIRONMENTAL ASSESSMENT

September 2009

[This page intentionally left blank.]

EXECUTIVE SUMMARY

The Baltimore-Washington Parkway (Parkway) is a 29-mile route running between the eastern boundary of the District of Columbia and Baltimore, Maryland. The original portion of the Parkway, which is federally administered and opened to traffic in October 1954, extends between Anacostia Park in the District of Columbia and the northern boundary of Fort Meade at Maryland Route 175 (MD 175) in Maryland. The Parkway was authorized for construction by the Act of August 3, 1950 (64 Stat. 400). Initially, the majority of the Parkway corridor extended through undeveloped land. Since its construction, considerable suburban growth, stimulated in part by the presence of the roadway, has occurred adjacent to the Parkway corridor.

In response to requests from Anne Arundel County, Maryland (County), state and local elected officials, and adjacent property owners, the National Park Service (NPS) is evaluating the potential impacts associated with the proposed issuance of a Right-of-Way (ROW) permit to the County for the installation of public utilities, including water and sanitary sewer, beneath the Parkway. The utility crossing would be located on the north side of Maryland Route 198 (MD 198) at its intersection with the Parkway. Also, as part of this project, the NPS would receive viewshed protection for the Parkway in the form of building height restrictions and buffers, and the Patuxent Research Refuge (Refuge) would receive additional protection from the encroachment of development.

This Environmental Assessment (EA) is intended to assist the NPS in making a decision as to whether to grant a ROW permit to the County authorizing the extension of existing utilities across the Parkway. The EA evaluates the potential for direct and cumulative impacts on natural and cultural resources associated with the Parkway and the Refuge from the implementation of two feasible alternatives. Alternative 1, the no action alternative, evaluates the potential impacts anticipated to result from future development along the MD 198 corridor east of the Parkway. This is based on both the current extent of available public utilities and future enhanced public utilities achieved without crossing the Parkway. Alternative 2, the proposed action alternative, assesses the potential impacts to the Parkway and the Refuge that would result from NPS granting a ROW permit authorizing the installation of utilities crossing under the Parkway near its intersection with MD 198.

Impacts of the proposed alternatives were assessed in accordance with the National Environmental Policy Act (NEPA) (42 U.S.C. 4321 et seq., 1969, as amended) the Council on Environmental Quality (CEQ) regulations (40 CFR 1500-1508), and the National Park Service Director's Order #12: Conservation Planning, Environmental Impact Analysis and Decision Making, which requires that impacts to the park resources be analyzed in terms of their context, duration and intensity (rev. January 8, 2001).

Note to Reviewers and Respondents:

If you wish to comment on the EA, you may mail comments directly via US Post or submit them electronically. Before including your address, phone number, e-mail address, or other personal identifying information in your comment, you should be aware that your entire comment, including your personal information, may be made publicly available at any time. While you can request in your comment that we withhold your personal information, we cannot guarantee that we will be able to do so.

Mailed comments can be sent to:

Stephen Syphax
National Capital Parks - East
1900 Anacostia Drive, SE
Washington DC 20020

Comments can also be submitted electronically on-line by following the appropriate links at: http://parkplanning.nps.gov/BAWA

[This page intentionally left blank.]

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

1.0 PURPOSE, NEED, AND SCOPE

In response to requests from adjacent property owners, Anne Arundel County, Maryland (County), state and local elected officials, the National Park Service (NPS) is evaluating the potential impacts associated with the proposed issuance of a Right-of-Way (ROW) permit to the County for the installation of public utilities, including water and sanitary sewer, beneath the Baltimore-Washington Parkway (Parkway). The utility crossing would be located on the north side of Maryland Route 198 (MD 198) at its intersection with the Parkway (See Figures 1-1 and 1-2.).

1.1 Purpose of the Action

The purpose of this action is:

1. To provide resource protection to the Parkway and Refuge in light of future development of adjoining properties.
2. To allow the County to meet its master plan utility service goals.
3. To provide water and sewer services to the MD 198 corridor.
4. To provide redundant water supply to the Maryland City Service Area west of the Parkway.

1.2 Need for the Proposed Action

Because the Parkway does not have protection for its viewshed beyond its property boundary, the NPS evaluates ways of acquiring buffers, easements or other protections for the NPS property as opportunities present themselves. In addition, the Refuge is facing a range of development related pressures along the northern boundary. A proposal to allow utility installation beneath the Parkway brings with it the opportunity to acquire additional protection for both the Parkway and the Refuge.

Current zoning regulations within the county allow developers or landowners to clear land and build structures up to the property boundary of the Parkway. There are no height restrictions, viewshed requirements or buffer mandates to protect the Parkway from encroachment and negative viewshed impacts. This project would give the Parkway and the Refuge protection in this one area by limiting building heights and providing a forested buffer between the Parkway and Refuge and the proposed development.

The installation of the water and sanitary sewer utilities beneath the Parkway is proposed to enhance the current network of water and sanitary sewer service provided by the Anne Arundel County Department of Public Works. The installation of these utilities at this location is included in the County's Master Plan for Water Supply and Sewerage Systems. The county proposes to secure the installation of these utilities for redundancy of water supply to the Maryland City service area as well as to support long range planning for water and sewer services along the MD 198 corridor between the Parkway and Fort Meade.

The EA evaluates the potential for direct and indirect impacts on natural and cultural resources associated with the Parkway and the Refuge anticipated from the implementation of two feasible alternatives. Alternative 1, the no action alternative, evaluates the potential impacts anticipated to result from future development along the MD 198 corridor east of the Parkway based upon the current extent of available public utilities and upon enhanced utility access achieved without crossing the Parkway. Alternative 2, the proposed action alternative, assesses the potential impacts to the Parkway and the Refuge that would result from NPS granting a ROW permit authorizing the installation of utilities to cross under the Parkway near its intersection with MD 198. The additional protection and buffers gained by the Parkway under Alternative 2 will also be detailed.

This EA has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969 and implementing regulations, 40 CFR 1500-1508, and NPS Director's Order #12 and Handbook, *Conservation Planning, Environmental Impact Analysis and Decision Making* (NPS 2001). Compliance with Section 106 of the National Historic Preservation Act of 1966 has occurred in conjunction with the NEPA process.

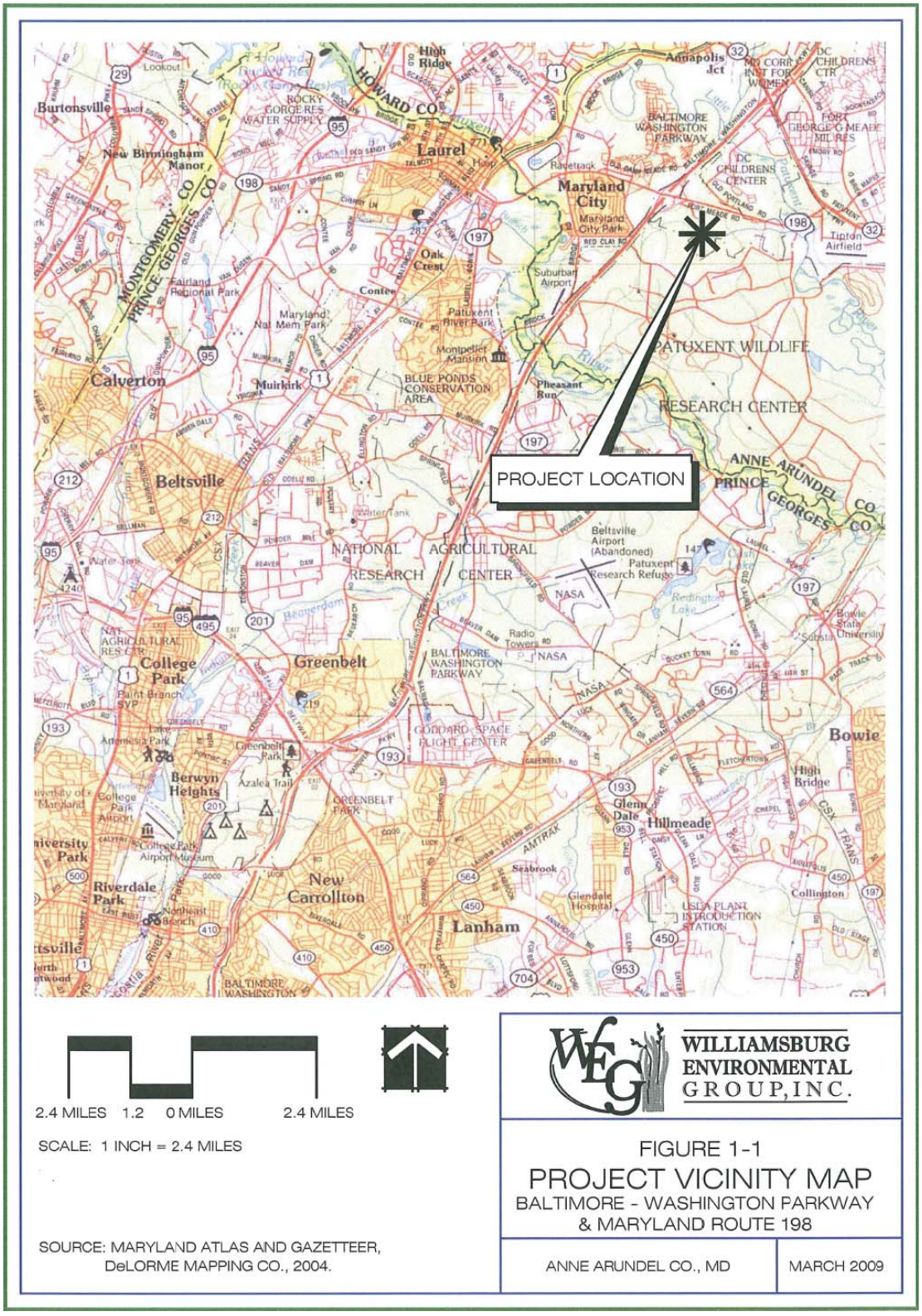

Figure 1-1 Project Vicinity Map

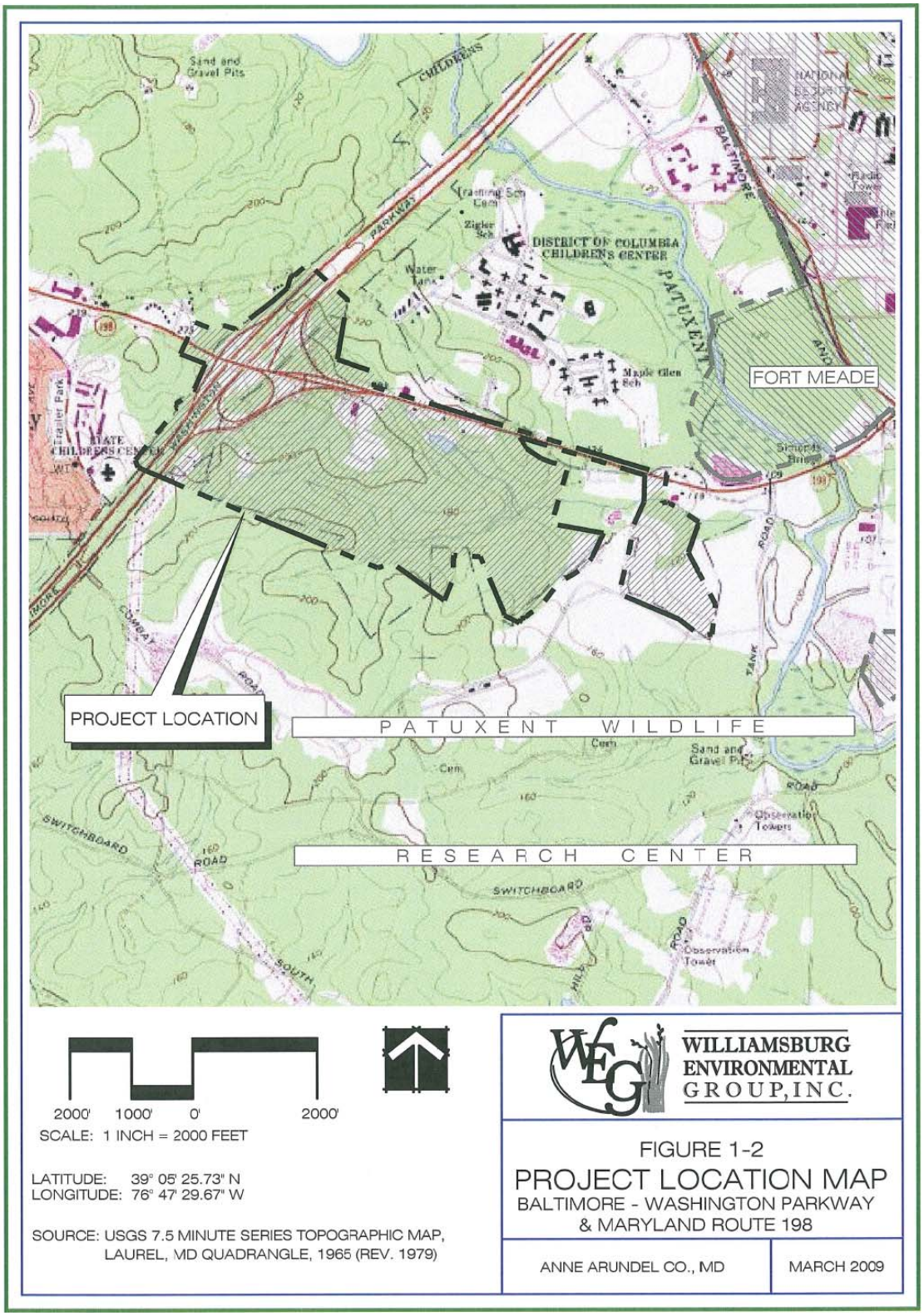

Figure 1-2 Project Location Map

1.3 Background

The Parkway is a 29-mile route running between the eastern boundary of the District of Columbia and Baltimore, Maryland. The Parkway was authorized for construction by the Act of August 3, 1950 (64 Stat. 400). The Parkway was subsequently extended northward by the Maryland State Highway Administration and linked the two metropolitan areas along the "fall line" where the Atlantic Coastal Plain meets the Piedmont Region. Initially, the majority of the Parkway corridor extended through undeveloped land. Since its construction, considerable suburban growth, stimulated in part by the presence of the roadway, has occurred adjacent to the Parkway corridor.

During the 1930s, the New Deal programs promulgated by President Franklin Roosevelt led to a heightened awareness of proposals to build what is now the Baltimore-Washington Parkway. Spiraling accident levels on US 1, combined with awareness of the need to mobilize national defense before World War II led to further proposals by the Maryland State Roads Commission, as well as increased pressure to build the Parkway as a way to facilitate the growth of what is now known as Baltimore-Washington International Thurgood Marshall Airport, or BWI. In 1944, federal and state officials commissioned the firm J.E. Greiner to create designs for the Parkway. Their designs included a large Y-junction at the southern terminus to connect with New York Avenue and the proposed Anacostia Freeway, with provision for a further parkway (now the John Hanson Highway). The northern end included a similar junction, with one end running to US 40 Franklin Street and the other end crossing the Inner Harbor, but this was modified in 1945 to the current configuration.

The Parkway consists of two distinct segments managed respectively by the NPS and the Maryland State Highway Administration. The state-owned portion of the Parkway was authorized under a state statute (Laws of Maryland, Chapter 644, May 6, 1943). Setup by the National Capital Commission, this Act allowed the state to deed lands over to the Federal Government for use in the construction of the Parkway. Construction on the northern 12 miles of the highway was begun in 1947 by the State of Maryland, with the NPS segment being started three years later in 1950. This extension of the NPS segment was authorized for construction by the Act of August 3, 1950, Chapter 64 Stat. 400, giving the NPS full jurisdiction over this section of the Parkway. The state-owned segment was completed in 1952, with the federal-owned segment being completed two years later, making it the first limited-access highway in Maryland. Motorists could travel the 30.8 miles (49.6 km) between the two cities in 45 minutes.

A valuable public resource located adjacent to the Parkway is the Refuge, which was established in 1936 and has grown from its initial 2,760 acres to its present size of over 12,800 acres. In October 1991, 7,600 acres were transferred from Fort Meade to the Patuxent National Research Refuge; in January 1993, another 500 acres were transferred. The Refuge is the nation’s only National Wildlife Refuge established to support wildlife research.

The North Tract of the Refuge includes 8,100 acres and is located east of the Parkway and south of MD 198 and MD 32 on land surrounding the Patuxent and Little Patuxent Rivers. The Refuge supports a wide diversity of wildlife in forest, meadow and wetland habitats. As one of the largest forested areas in the mid-Atlantic, the Refuge provides critical breeding habitat for many populations of migratory birds. The northern boundary of the Refuge adjoins land planned for imminent development. Currently, no zoning regulations are in place to protect the Refuge from the development.

Land Use

The project area encompasses and borders many different land uses. Current land use east of the Parkway/MD 198 interchange is characterized as open space with small areas of retail, industrial, and also government land including the Refuge and Fort Meade. The area immediately west of the Parkway consists of mostly retail development.

Existing zoning within the study area allows industrial and commercial uses (Figure 1-3). The majority of land along the MD 198 corridor east of the Parkway is zoned W-1 (Industrial Park District). W-1 zoning is for the development of “clean” industry that would result in minimal nuisance. Developments are

intended to have a landscaped park-like setting and include offices, research and development laboratories, and light manufacturing. W-1 zoning also allows office supply stores, restaurants, and hotels or motels that support the industrial park district. Maximum lot coverage is 75 percent. W-1 zoning does not have a building height limit but requires minimal setbacks based upon building height (Anne Arundel County Zoning Code, 2005).

In addition to W-1, a small area near the interchange is zoned C-4 or Highway Commercial. Highway Commercial in intended for larger scale auto-oriented retail and services businesses to be located along major traffic routes. C-4 allows most of the commercial uses of C-3 along with the auto-oriented uses. Maximum lot coverage is 85 percent and building height is restricted to 60 feet (Anne Arundel County Zoning Code, 2005).

Transportation

Within the study area, there are two main transportation arteries that serve the surrounding area the Parkway and Maryland Route 198 (Fort Meade Road). The Parkway is characterized as a four-lane divided highway. MD 198 is a six-lane highway west of the Parkway, four-lanes at its interchange with the Parkway and two-lanes east of the Parkway. The MD 198 corridor has recently been studied by the Maryland State Highway Administration (MDSHA) as a potential location for improvements (MD-198 Project Planning Study. Project Newsletter – Fall 2007).

Current traffic levels in the area were studied in 2006 as part of the MDSHA project planning study. As part of the study, Annual Average Daily Traffic (AADT) was calculated for two portions of the study area. The Parkway south of its intersection with MD 198 was estimated to have an AADT of 93,600 cars. Route 198 west of the Parkway to Airfield Road was estimated to have 21,750-23,950 cars. Other roads in the region including MD 32 and MD 198 west of the Parkway were all estimated to have higher traffic loads than MD 198 within the study area.

The planning study also determined a level of service (LOS) for intersections within the study area. To determine the LOS, intersections are graded A through F, A being the best and F being the worst. A poor LOS grade indicates a failing intersection, which is characterized by long delays and high levels of congestion. Grades were produced at each intersection within the study for AM and PM peak-hour volumes. Two intersections within the study area were graded an “F” for both AM and PM volumes. These intersections were both located at the entrance to car dealerships with access from MD 198 adjacent to the MD 198/Parkway interchange. In addition, two intersections scored an “E” for AM LOS, indicating a very poor level of service at the intersection. These intersections are at Route 198’s intersection with Old Portland Road (MD 216) and with Welch’s Court. The intersection at MD 216 improves in the PM to a LOS grade of D, while the Welch’s Court intersection is further degraded to a grade of F. Only one intersection within the study area scored well, the MD 198 intersection at the proposed development was graded an A for AM traffic and a B for PM traffic (MDSHA, 2007). The study area is also served by mass transit and is traversed by Maryland’s MARC commuter rail service, although there is not a MARC station located within the study limits of the EA.

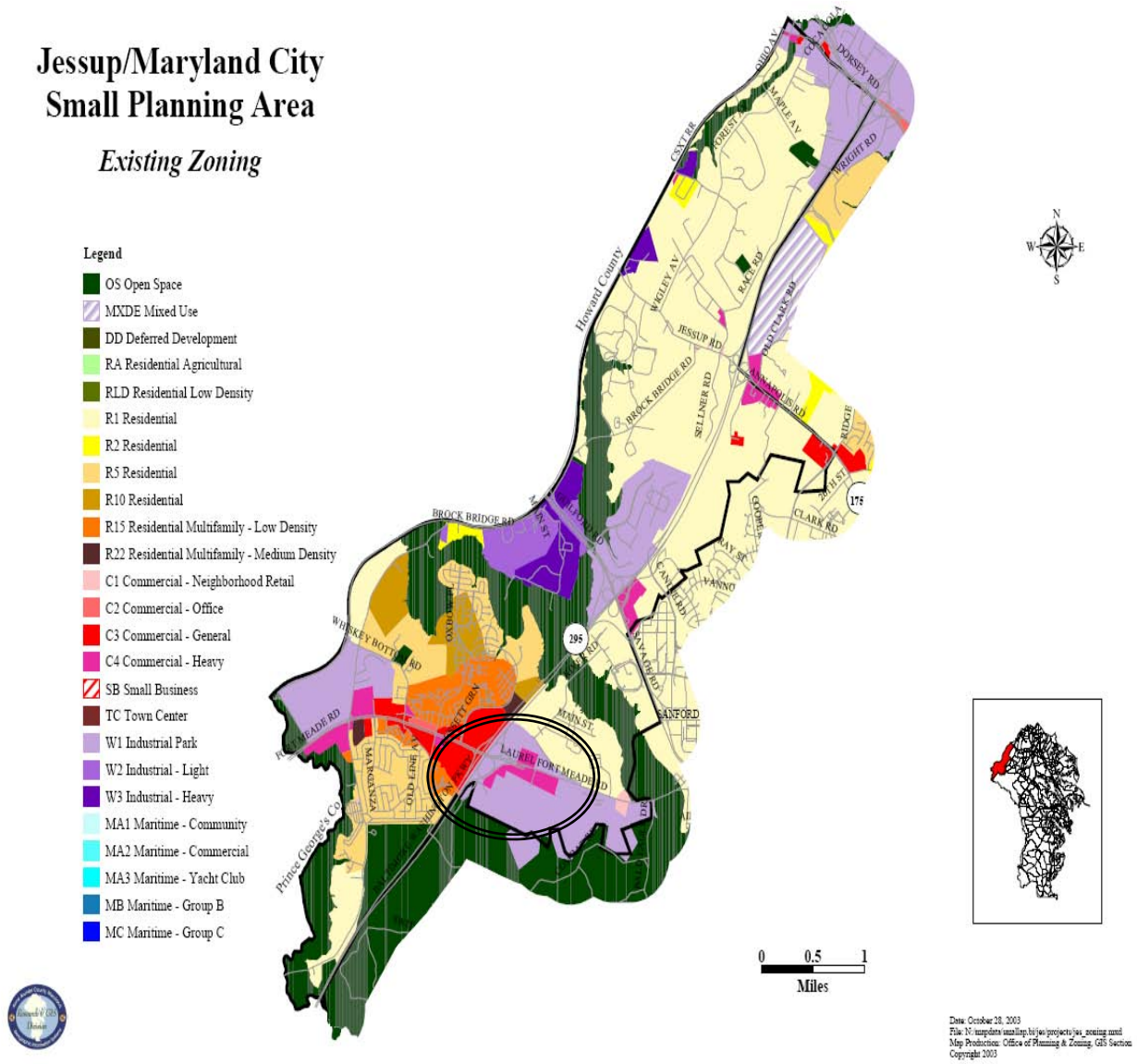

Figure 1-3 Existing Planning and Zoning in Project Area
(http://www.aacounty.org/PlanZone/SAP/Resources/JessupMap04.pdf)

1.4 Plans, Policies and Regulations

Organic Act

The NPS was created on August 25, 1916, by Congress through the National Park Service Organic Act (16 United States Code, sections 1, 2, 3 and 4). The mandate carried out by this act is to,

> "*...conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.*"

Baltimore Parkway Legislation

Three legislative actions that contributed to the existence of the Parkway include Act of May 29, 1930, Volume 46, Chapter 354, pgs 482-485 (U.S. Statutes at-large from 1930) for the land acquisitions needed in DC & Maryland; the Laws of Maryland, Chapter 644, May 6, 1943 (State Statue from 1943) which allowed the National Capital Planning Commission to deed lands of the Federal Government for use in the Parkway construction; and the Act of August 3, 1950, Chapter 64, pgs 400-402 (U.S. Statutes from 1950) which provided construction and maintenance funding for the extension of the Parkway to D.C. by the Secretary of the Interior.

National Environmental Policy Act

In 1969, the United States Congress passed the National Environmental Policy Act (NEPA) (42 U.S.C. 4321 et seq.) to establish a national policy,

> *"…which will encourage productive and enjoyable harmony between man and his environment; to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man; to enrich the understanding of the ecological systems and natural resources important to the Nation;…"*

NEPA requires federal agencies to consider the potential for environmental impacts before deciding on a proposed federal action. Federal actions are defined as projects, activities, or programs funded in whole or in part under the direct or indirect jurisdiction of a federal agency, including those carried out on behalf of a federal agency; those carried out with federal financial assistance; those requiring a federal permit, license, or approval; and those subject to state or local regulation administered pursuant to a delegation or approval by a federal agency. An EA is prepared to determine whether the proposed federal action will result in significant impacts upon the environment. If the EA concludes that no significant impacts will result from the proposed action, a Finding of No Significant Impact (FONSI) will be issued. If it is concluded that the proposed action will result in significant impacts upon the environment, the agency must prepare an Environmental Impact Statement (EIS).

Maryland Forest Conservation Act

The main purpose of the Maryland Forest Conservation Act (Natural Resources Article Section 5-1601 through 5-1613), enacted in 1991, was to minimize the loss of Maryland's forest resources during land development by making the identification and protection of forests and other sensitive areas an integral part of the site planning process. Identification of priority areas prior to development makes their retention possible. Of primary interest are areas adjacent to streams or wetlands, those on steep or erodible soils or those within or adjacent to large contiguous blocks of forest or wildlife corridors.

Anne Arundel County Sewer and Water Master Plan

Title 9, Subtitle 5 of the Annotated Code of Maryland requires each county to develop water supply and sewerage systems in accordance with a County Master Plan which specifies the extent, adequacy, sizing, staging and other characteristics of such facilities so that they are in compliance with state laws relating to air pollution, water pollution, environmental protection and land use. The Anne Arundel County *Master Plan for Water Supply and Sewerage Systems* includes goals, objectives, policies and procedures as well as background information, descriptions of facilities and service areas, population and flow projections, strategies for facility optimization, and policies to address problem areas in both water supply and sewerage systems.

The goals of the *Master Plan for Water Supply and Sewerage Systems* are as follows:

1. Ensure a sufficient supply of water will be collected, treated and delivered to the points of use where it is programmed for service,
2. Wastewater collection will be from and extended to areas programmed for growth and delivered to points best suited for waste treatment and disposal or reuse,

3. Both services shall be monitored and maintained in a manner that strives to maximize the public health, safety and welfare for all while minimizing every environmental impact, and
4. Incorporate the water and sewer planning principles of the Maryland Department of Planning and Smart Growth initiatives to achieve best land management practices, highest water quality protection management, and partnered financial support.

The County's first *Master Plan for Water Supply and Sewerage Systems* was completed in 1966 and recommended providing public water and sewer service to 86 percent of the County's land area by the year 2000. At that time, public sewer was serving 10 percent of the County. The areas planned for water and sewer service have been reduced over the last 30 years based on growth management and environmental policies adopted in the 1978 and 1986 GDPs. The revised service areas have been reflected in subsequent updates to the Water and Sewer Master Plan.

Subsequently, a detailed study titled *Comprehensive Water Strategic Plan* was conducted in 2003 for the County. It coordinated the findings of planning projections, peaking characteristics, demand forecasting, groundwater projections, hydraulic modeling analyses and criteria for system improvements to develop a proposed capital improvement schedule, which includes cost estimates and an implementation period. In addition, a *Comprehensive Sewer Strategic Plan* was completed in 2007 that consisted of a two-phase approach for planning future modifications and expansion of the County's existing wastewater collection and treatment system. These studies and more accurate data have led to revisions to existing and planned service.

Both the water and sewer service areas are divided into service categories to indicate level of service: Existing, Capital Facilities, Planned, Future, Other and No Public Service. The Existing, Capital Facilities, Planned and Future categories represent the area to be ultimately served by public utilities. The Other category represents areas served by systems other than Anne Arundel County. The No Public Service category represents the area not planned for public utility service.

The most recent update to the Water and Sewer Master Plan was completed in 2007. The current area served by public water is 31 percent of the County's land area, and the ultimate area of the County to be served is 43 percent. The area currently served by public sewer is 27 percent of the County's land area, and the ultimate area to be served is 43 percent.

Water Supply

The water-bearing aquifers which supply most of the water for Anne Arundel County are from oldest to youngest, the Patuxent, Lower Patapsco, Upper Patapsco, Magothy and Aquia. These aquifers overlay much older, consolidated bedrock that has little or no water supply potential for the County. Approximately 22 percent of the water supply is purchased water from Baltimore City, which comes from surface water sources.

The County's water system contains interconnections between pressure zones, which include twelve areas established for providing adequate water supply facilities. The remaining land is either served by the City of Annapolis or Fort Meade or is designated as Rural.

The *2003 Comprehensive Water Strategic Plan* identified objectives to guide the planning of facilities and infrastructure necessary for meeting expected growth while optimizing the use of potential County groundwater resources: (1) centralize facilities when possible, (2) create in addition to the water supply wells that the County owns and operates, agreements between the County and the City of Baltimore provide rights to purchase up to 32.5 million gallons per day (MGD) (maximum day). The County used 10.3 MGD (maximum day) from the Baltimore City supply in 2006 and is projected to use 19.7 MGD (maximum day) by 2043.

Because of concerns over the reliability and future quality of the Baltimore City water supply, the *2003 Comprehensive Water Strategic Plan* promotes a self-reliance strategy by expanding County

infrastructure. By optimizing the use of existing and potential supply wells, reliance on the Baltimore City system will be minimized.

Sewerage Systems

Eleven separate and distinct sewer service areas have been established for providing sewerage facilities to serve Anne Arundel County. The remaining land is designated as Rural and is not planned for service by public sewer facilities. Of the eleven sewer service areas, eight are served by facilities owned and operated by the County. Two of the service areas have conveyance systems that are operated and maintained by the County but the treatment facilities are located in neighboring jurisdictions. Intra-jurisdictional agreements permit the transport of wastewater from the Baltimore City Sewer Service Area to the Patapsco Sewage Treatment Plant in Baltimore City and from the Rose Haven / Holland Point Sewer Service Area to the Chesapeake Beach Wastewater Treatment Plan in Calvert County. The Piney Orchard WWTP is a privately owned and operated treatment facility; however, the collection system is owned and maintained by the County. The County currently has over 111,000 sewer connections and treats approximately 34.1 MGD (2005 total flow).

A *Comprehensive Sewer Strategic Plan* was conducted for the County between 2003 and 2007 in a two-phase approach for planning the future modifications and expansion of the existing wastewater collection and treatment system (Figure 1-4). In Phase I of the study, the County's wastewater treatment plants were evaluated on a number of criteria including the states anticipated effluent total nitrogen discharge goals and other future discharge permit requirements. Phase II evaluated ways to expand or modify the existing wastewater conveyance system to route flow toward treatment plants with the most available capacity to accommodate future growth in a cost effective manner. The major recommendations and findings of this study were incorporated into the *2007 Water and Sewer Master Plan*.

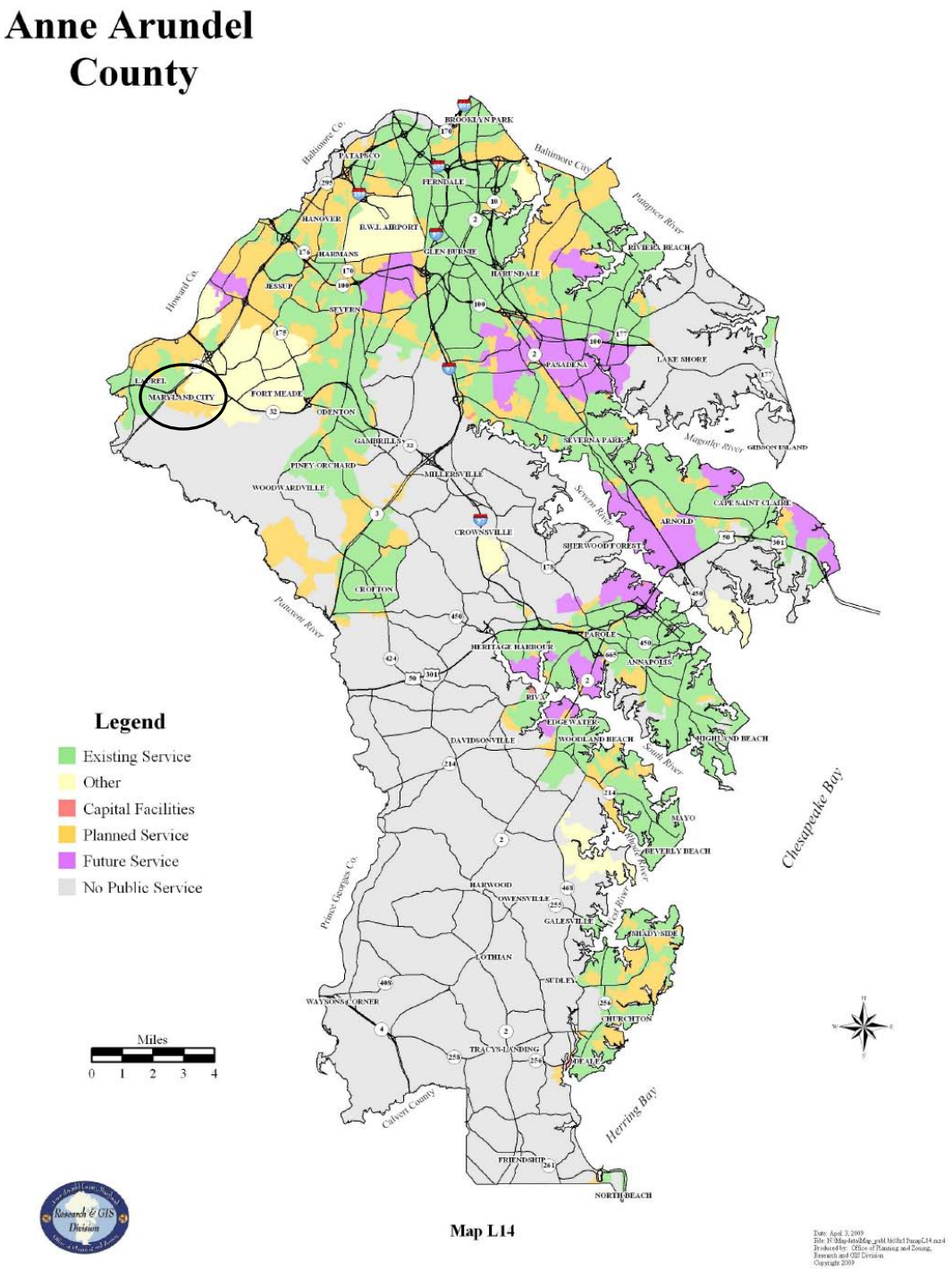

Figure 1-4 Sewer Service and Future Planned Service
(http://www.aacounty.org/PlanZone/Resources/GISSewer.pdf)

Consistent with the state's initiatives to address point-source pollutant loads from wastewater treatment plants, the County has upgraded and installed Biological Nutrient Reduction (BNR) processes and infrastructure at all of its major water reclamation facilities (WRFs). In addition, the County recently agreed to execute a Memorandum of Understanding (MOU) with the Maryland Department of the Environment (MDE) establishing targeted project schedules and respective commitments toward completing enhanced nutrient removal (ENR) upgrades at the Cox Creek, Annapolis, Broadneck,

Broadwater, Mayo, Patuxent and Maryland City facilities. This is in response to the Chesapeake Bay 2000 Agreement that requires further reduction in nitrogen by about 20 million pounds and in phosphorus by about 1 million pounds per year. To meet these objectives, expansion of existing facilities and development of new facilities are proposed.

Maryland City Sewer

The Maryland City sewer service area encompasses approximately 6,770 acres and includes the portion of the Patuxent River drainage basin west of Fort Meade. It covers the area south of MD 175 and extends from the western boundary of the County eastward and southward to the limits of Fort Meade. The service area includes the community of Maryland City, the Russett PUD, and portions of Jessup and extends east of the Parkway to include a large tract of federally owned property leased by the District of Columbia (Master Plan for Water Supply and Sewerage Systems).

Population within Maryland City sewer service area is projected to increase to approximately 23,491 residents by 2030. Anticipated development over the planning horizon includes the continued build out of the National Business Park, a new industrial park development on the Kenterra property in Annapolis Junction, redevelopment on the Laurel Race Track site, some commercial revitalization along MD 198, a planned mixed use development on the Clarks 100 site in Jessup and development of several large tracts of land south of MD 198 adjacent to the Patuxent Wildlife Refuge which are planned for industrial park use on the current Land Plan. In order to serve properties near MD 198 east of the Parkway, sewer facilities could be extended from existing facilities in Maryland City or be shifted to Fort Meade or the Piney Orchard WWTP.

1.5 Scoping

During the scoping phase of the project, NPS sought to receive feedback from applicable federal, state, and local agencies on the proposed action. On January 8, 2008, an agency scoping meeting was held at the Maryland City Volunteer Fire Station in Laurel, MD. The meeting was attended by representatives from the U.S. Fish and Wildlife Agency, Fort Meade, Maryland State Highway Administration, Maryland Department of Transportation, Anne Arundel County Public Works, Anne Arundel County Office of Planning and Zoning, Anne Arundel County Council and representatives from the offices of U.S. Congressman Steny Hoyer and the Lieutenant Governor.

The meeting provided an opportunity to present the proposed action and respond to questions or concerns from the agencies in attendance. During the meeting, it was established that the proposed action would fulfill the long-term plans of the County Department of Public Works (DPW) for water line redundancy in the region and many questions were raised and addressed regarding the scope of the EA and impacts from future development in the area.

On February 6, 2008, the NPS held a public scoping meeting at the Maryland City Volunteer Fire Station in Laurel, MD to present the available details of the proposed action and to solicit input from the public regarding the scope of the EA. Representatives from NPS, Anne Arundel County Public Works, Ribera Development, USFWS and at least 35 people from the public attended the meeting.

The most reoccurring theme and comments at the meetings was the development of the Arundel Gateway property if the utility lines are built under the NPS property. Although the property is currently zoned for light industrial that can be built without a sewer line extension, the general perception is that there would be no development without the sewer line under the Parkway. The issues listed below are the result of the scoping process.

1.6 Issues

Issues describe problems or concerns associated with impacts from environmental conditions or current problems, as well as problems that may arise from the implementation of any of the alternatives. Potential issues dealing directly with the proposed action that arose during both internal and external scoping included:

- Possibility of increased development and traffic;
- Impacting the use of the Refuge for hunting;
- Water quality impacts from adjacent development; and
- Forest fragmentation and loss of forest habitat.

1.7 Impact Topics

The following topics and associated impacts are discussed in further detail in the "Affected Environment" and "Environmental Consequences" chapters. These topics are resources of concern that could be beneficially or adversely affected by the actions proposed under each alternative. These topics relate to issues identified at the public and agency scoping meetings, regulations, federal law or by the NPS and FWS during their interaction with the project. A brief rationale is given for the selection of each impact topic, as well as rationale for dismissing specific topics from further consideration.

Soil Resources

Both the action and no action alternatives include land clearing, loss of vegetation and land disturbing activities in areas adjacent to the Parkway and Refuge and have the potential to impact soil resources.

Visitor Use and Experience

The purpose of the Parkway is to provide a scenic motoring experience while driving between Baltimore and Washington, D.C. The current zoning is detrimental to maintaining a scenic experience by allowing development to clear vegetation up to the Parkway property boundary.

As a result of potential impacts from both the no action and action alternatives, impacts to visitor use and experience are addressed as an impact topic in this EA.

Water Quality

The no action alternative contains no provisions for the protection of the Refuge water quality beyond standard state and local regulations. The action alternative will create a Water Monitoring Plan to police the quality of the water entering the delicate system, creating a beneficial impact. Impacts to the Refuge could include receiving increased stormwater runoff from the developed parcels, along with increased sedimentation.

Cultural Resources

The National Historic Preservation Act (NHPA; 16 USC 470 et seq.), NEPA, NPS 1916 Organic Act, the NPS 2006 Management Policies (NPS 2006), DO-12 (Conservation Planning, Environmental Impact Analysis and Decision Making) and NPS-28 (Cultural Resources Management Guideline) require the consideration of impacts on any cultural resources that might be affected and on cultural resources either listed or eligible to be listed on the National Register of Historic Places (NRHP). Cultural Resources include archaeological resources, cultural landscapes, historic districts and structures, ethnographic resources and museum objects, collections and archives. Because neither the no action nor proposed action alternatives would result in any impacts to archeology, cultural landscapes, ethnographic resources and museum collections, these impact topics were dismissed from further analysis (See Section 1.8 for dismissal rationale).

The Parkway is listed on the National Register as a historic district, constructed between 1942 and 1954, and as such requires consideration and protection under the National Historic Preservation Act (NHPA; 16 USC 470 et seq.). Because the no action alternative provides no protective measures to ensure the viewshed of the Parkway is maintained, impacts to historic structures and districts was included as an impact topic.

Vegetation

The no action alternative would leave current zoning regulations unchanged, which would allow the clearing of mature vegetation up to the property line of the Parkway and the Refuge, creating a major adverse impact. Conversely, the action alternative contains requirements that would be included within the right-of-way documents to preserve vegetated areas and create viewshed buffers for both the Parkway and Refuge, which is considered a beneficial impact. As a result, vegetation was addressed as an impact topic in this EA.

Wildlife and Wildlife Habitat

The Refuge's goal is to provide a safe habitat for the wildlife species that reside there. Any proposal that would clear vegetation, fragment forests or make organisms within the Refuge vulnerable would create an adverse impact. Both alternatives would affect wildlife and wildlife habitat from in the clearing and development of the Arundel Gateway property; however, the action alternative would rely on conditions written into the County's permit resulting in buffers and protection for the Refuge and the wildlife.

1.8 Impact topics dismissed from further analysis and consideration

Soundscapes

In accordance with the NPS *2006 Management Policies* (NPS 2006) and DO-47, Sound Preservation and Noise Management, are important parts of the NPS mission in the preservation of soundscapes associated with parks. However, since ambient noise in the study area would be dominated by automobile traffic from the Parkway and MD 198, the natural soundscape attributed to more traditional parks has already been lost. Noise levels from a busy urban street or at 50 feet from a major freeway range from 70 to 80 decibels (Colorado DOT, 2005). The Refuge is located some distance from the placement of the utility lines and will not be in the range of the generated noise.

Under either of the proposed alternatives, construction noise of the utility lines would be of short duration, minor and localized, limited to the noise generated by construction equipment and drill rigs outside of either resource. The impact of the operation of the utility lines to either the Parkway or Refuge would be negligible. Because the impacts to the soundscape are considered of short duration, minor and negligible, this impact topic was dismissed from further consideration in this EA.

Environmental Justice

Presidential Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,* requires all federal agencies to incorporate environmental justice into their missions by identifying and addressing the disproportionately high and/or adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities. According to the 2000 U.S. Census data, the Maryland City area population is approximately 37.1 percent minority and approximately 3.6 percent of individuals live below the poverty line. The minority population in Maryland City is larger than Anne Arundel County as a whole (18.8 percent), as well as in the United States (24.9 percent). The number of individuals living in poverty in Maryland City is lower than in Anne Arundel County (5.1 percent) and the U.S. (12.4 percent).

While the minority population of the Maryland City area is significant, environmental justice was dismissed as an impact topic for the following reasons:

- The Park and Refuge staff and the project planning team have actively solicited public participation as part of the planning process and equally considered all input from persons regardless of age, race, income status, or other socio-economic or demographic factors;
- Implementation of the proposed alternatives would not result in any identifiable adverse human health effects. The creation of a utilities loop with redundant service under the action alternative would beneficially affect the health of all residents since water and sewer service is less likely to be disrupted; and

- The impacts associated with the implementation of either alternative would not disproportionately adversely affect and minority or low-income population or community

Air Quality

The Clean Air Act (CAA) of 1970 as amended in 1977 and 1990 requires the U.S. Environmental Protection Agency (EPA) to set air quality standards for pollutants, which may endanger public health or welfare and result from numerous sources. EPA created National Ambient Air Quality Standards (NAAQS) for what are known as criteria pollutants. There are six criteria pollutants: nitrogen oxides (NOx), carbon monoxide (CO), ozone (O_3), sulfur dioxide (SO_2), lead (Pb), and particulate matter with a diameter of up to 2.5 microns or 10 microns ($PM_{2.5}$ or PM_{10}) (EPA 2008).

Air quality testing is conducted throughout several geographical regions to ensure compliance with the CAA. If a particular region does not meet NAAQS for a criteria pollutant, it is classified as a non-attainment area and the regional governments must prepare a State Implementation Plan (SIP) to attempt to meet the standard. Non-attainment areas are categorized as severe, serious or marginal.

The Proposed Action is located in Anne Arundel County, Maryland. According to the EPA "Green Book" list of Non-Attainment Status by county, last updated on December 20, 2007, Anne Arundel County is a severe non-attainment area for 1-hour ozone, a moderate non-attainment area for 8-hour ozone, and a non-attainment area for 2.5 micron particulate matter. The data is consistent with the rest of the Baltimore-Washington region and has been attributed to motor vehicle exhaust and the emissions from coal-fired power plants located in the County (EPA 2008).

Should utility lines be constructed under the Parkway under the action alternative, or be extended from a different direction under the no action alternative, local air quality would be temporarily affected by dust and emissions of construction vehicles. Hauling materials and operating equipment would result in increased emissions during the construction period. The development of the Arundel Gateway parcel, under either alternative, is likely to cause fugitive dust plumes occasionally increasing airborne particulates near the site. It is expected that these temporary impacts during construction would not change regional air quality.

Regardless of which alternative is chosen, the Arundel Gateway parcel and others would be developed and would generate additional traffic in the project corridor that would affect air quality. The NPS cannot make a choice that would improve the air quality in this area, nor worsen the air quality. An extensive air quality study has not been done since the decision of the NPS cannot change the outcome of the amount of traffic generated.

Wetlands and Waters

Wetlands include areas inundated or saturated by surface or groundwater for a sufficient length of time during the growing season to develop and support characteristic soils and vegetation. The NPS classifies wetlands based on the FWS *Classification of Wetlands and Deepwater Habitats of the United States*, also known as the Cowardin classification system (Cowardin et al.1979). Based on this classification system, a wetland must have one or more of the following attributes:

- The habitat at least periodically supports predominantly hydrophytic vegetation
- The substrate is predominately hydric soil
- The substrate is non-soil and saturated with water, or covered by shallow water at some point in the growing season.

Likewise, streambeds are defined as a landscape element consisting of two banks and a bed that is capable of conveying confined surface flows downstream in a watershed. The morphology of a channel can be formed and maintained by incision associated with hillslope erosion or by processes of erosion and deposition within alluvial valleys (Maryland Department of Natural Resources).

Several unnamed tributaries, an open water feature, Midway Branch, and the Little Patuxent River are mapped within the study areas. The stream channel north of MD 198 is mapped as intermittent. This stream crosses MD 198 and drains to the open water feature mapped in the northern portion of the Arundel Gateway tract. The stream channel is mapped as perennial downstream of the open water feature. The tributary entering the Arundel Gateway tract from the west and generally flowing west to east is mapped as intermittent to a confluence with a stream channel entering the property from the south and is then mapped perennial at the confluence of these two systems. The stream channel serving as the southeast property boundary on the western parcel of this area is also mapped as intermittent. The Little Patuxent River and Midway Branch are mapped as perennial for the offsite study. All surface water features identified on the Laurel and Odenton quad maps [Laurel (1979) and Odenton (1979)] were present during field investigations with the exception of the open water feature in the northern portion of the Arundel Gateway tract. The impoundment has been breeched and site conditions have returned to their natural state. Proper erosion and sediment controls during construction would minimize any sediment runoff into surface waters.

Wetlands are areas such as swamps, marshes, and bottomlands that support a predominance of vegetation typically adapted to saturated conditions (hydrophytic vegetation), soils that formed under saturated conditions (hydric soils), and sufficient water at or near the soil surface to produce chemically reducing conditions (wetland hydrology). All three of the above parameters must be present for an area to be determined a jurisdictional wetland as regulated by the U. S. Army Corps of Engineers (Corps) under Section 404 of the Clean Water Act. Technical criteria and field indicators for each parameter are presented in the *1987 Corps of Engineers Wetland Delineation Manual* (Corps Manual) (Environmental Laboratory 1987).

McCarthy and Associates conducted a wetland delineation of portions of the Arundel Gateway tract identified as County Tax Map 20 Parcels 31 and 42. The wetland delineation was confirmed by the Corps in a letter dated September 1, 2005 (Appendix A). Geo-Technology Associates, Inc. conducted a wetland delineation of the remaining portions ofArundel Gateway owned property, but this delineation has not been confirmed by the Corps at this time. Portions of the wetlands were inundated at the time of site review due to beaver activity. The area north of MD 198 was delineated by WEG in February 2008 and has yet to be confirmed by the Corps. A preliminary wetland delineation offsite along MD 198 towards Piney Orchard WWTP was performed by WEG in April 2008 and has yet to be confirmed by the Corps. Soils observed within these wetlands were loamy in texture and of a low chroma suggesting prolonged periods of saturation. Soils that were not inundated were saturated to the surface. Hydrology indicators such as dark leaf litter, drift lines, and sediment deposits were also present. The wetland vegetation observed is described in Appendix A. Figure 1-5 is the wetland delineation map for the Parkway and Arundel Gateway tract. Figure 1-6 (sheets 1-6) contains the wetland delineation map for the offsite areas.

There would be no impacts to wetlands or streams for the proposed 16-inch water main and 16-inch sewer main installation under the Parkway due to the installation via directional drilling. The installation of the proposed 16-inch water main via open trenching to the intersection of MD 198 and MD 32 could result in temporary impacts to approximately 0.21 acre of scrub shrub wetlands and 80 linear feet (0.03 acre) of stream channel, and to approximately 0.02 acre of wetland buffer and 0.03 acre of stream buffer. All necessary permits will be obtained from the US Army Corps of Engineers and Maryland Department of the Environment for the temporary impacts outside the Parkway. Proper installation and maintenance of erosion and sediment controls during construction would minimize any sediment runoff into surface waters.

Floodplains

Information and technical data published by the Federal Emergency Management Agency (FEMA) were reviewed to determine the extent of the 100-year floodplain within the areas of study. General limits of the 100-year floodplain are derived from the Flood Insurance Rate Maps (FIRM) for Anne Arundel County, Maryland. The floodplain for the Little Patuxent River is east of the project area (Figure 1-7). Should the no action alternative be chosen, the possibility exists that utility lines would be placed along MD 198 across the floodplain. Since all construction impacts would be temporary and no permanent fill would be placed in the floodplain, the impact is thought to be negligible.

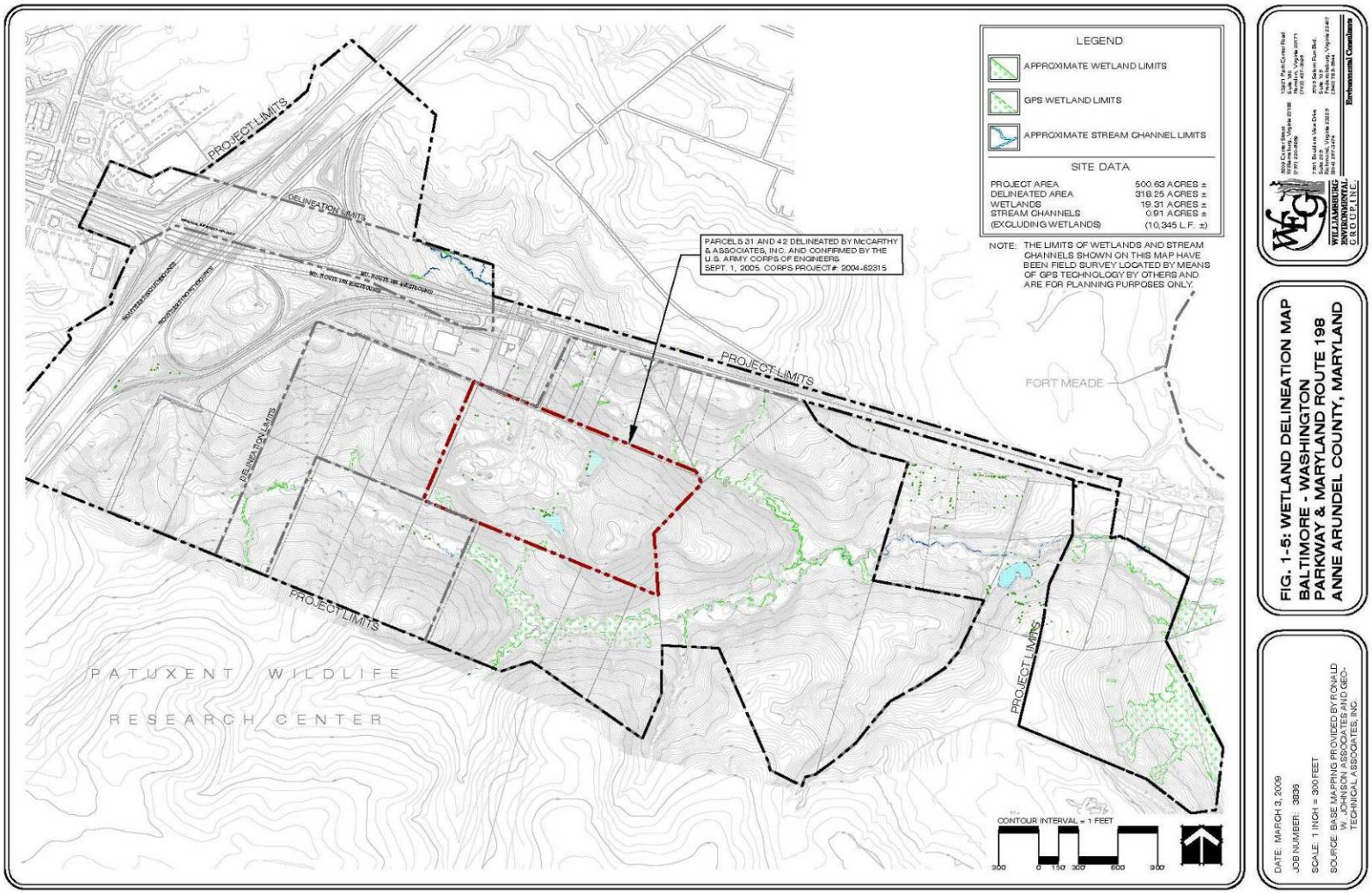

Figure 1-5 Wetland Delineation Map

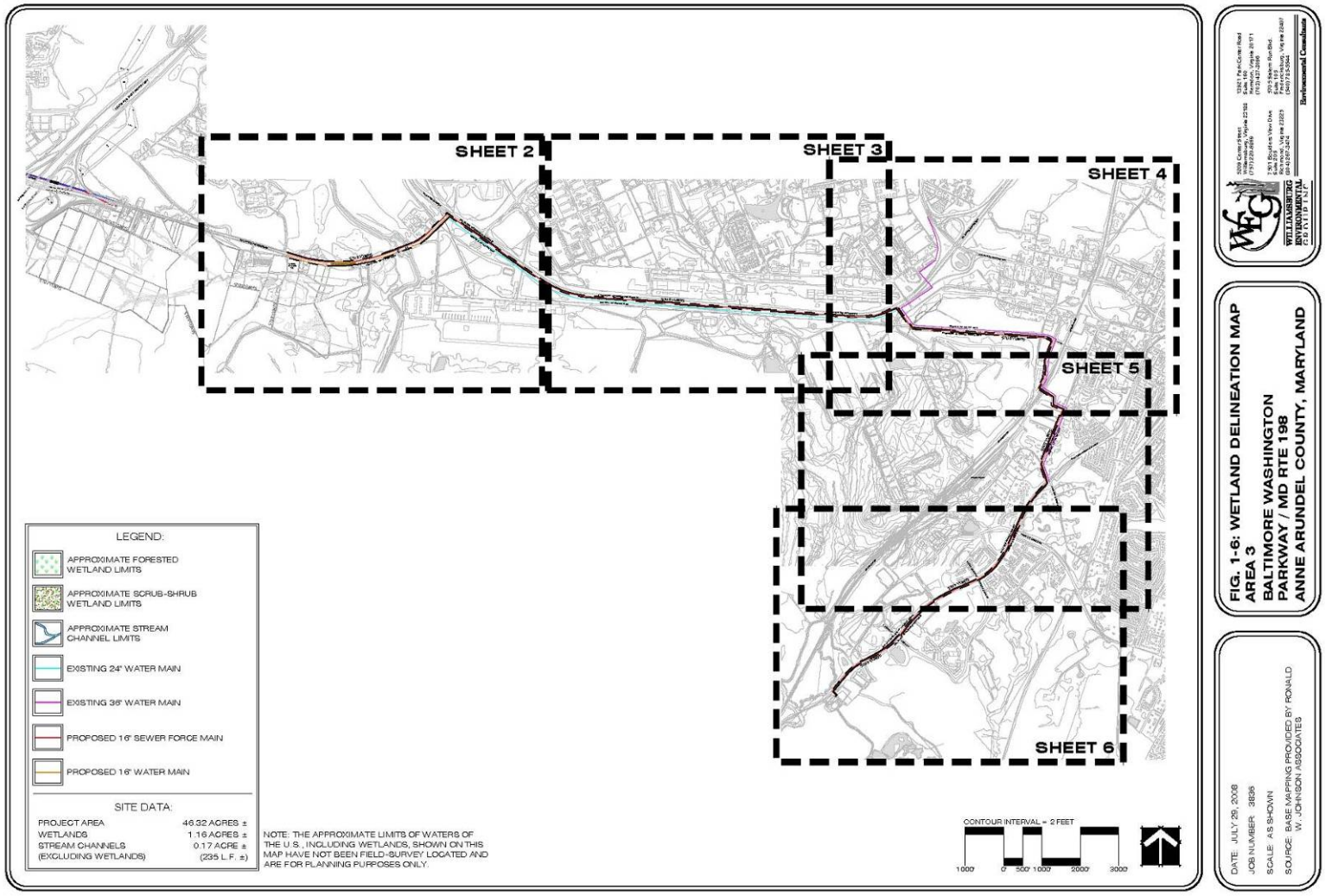

Figure 1-6 Wetland Delineation Map (1 of 6)

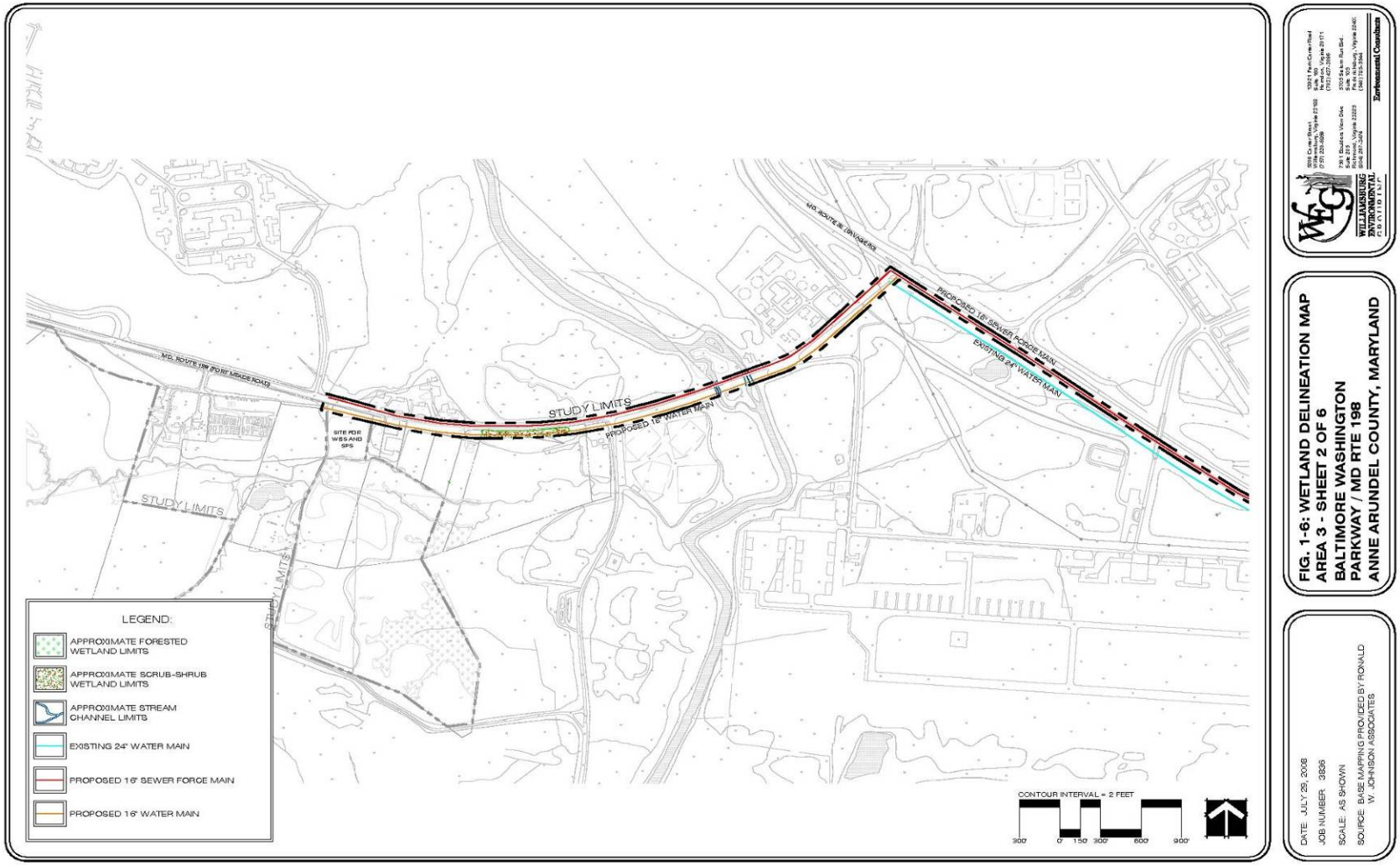

Figure 1-6 Wetland Delineation Map (2 of 6)

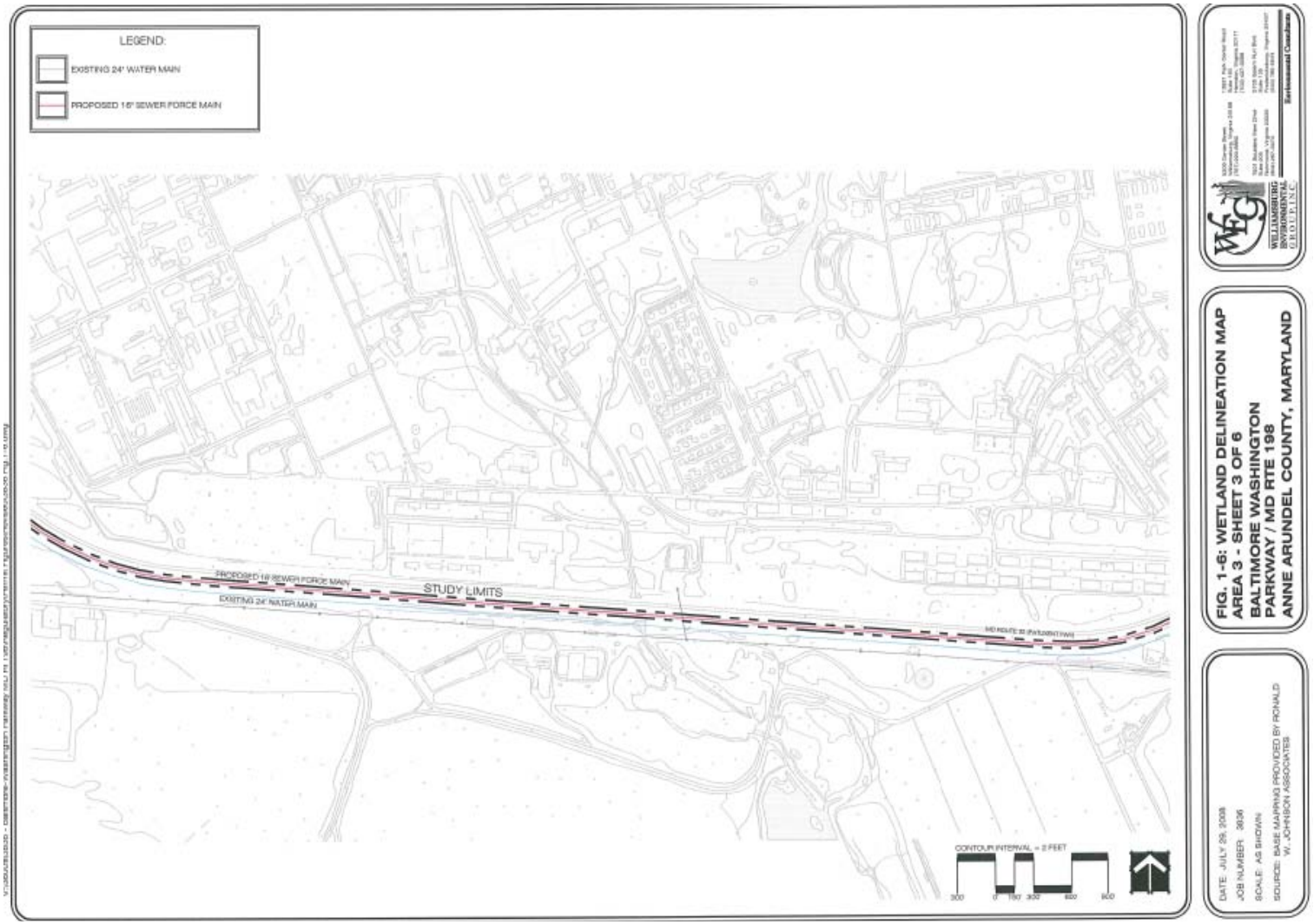

Figure 1-6 Wetland Delineation Map (3 of 6)

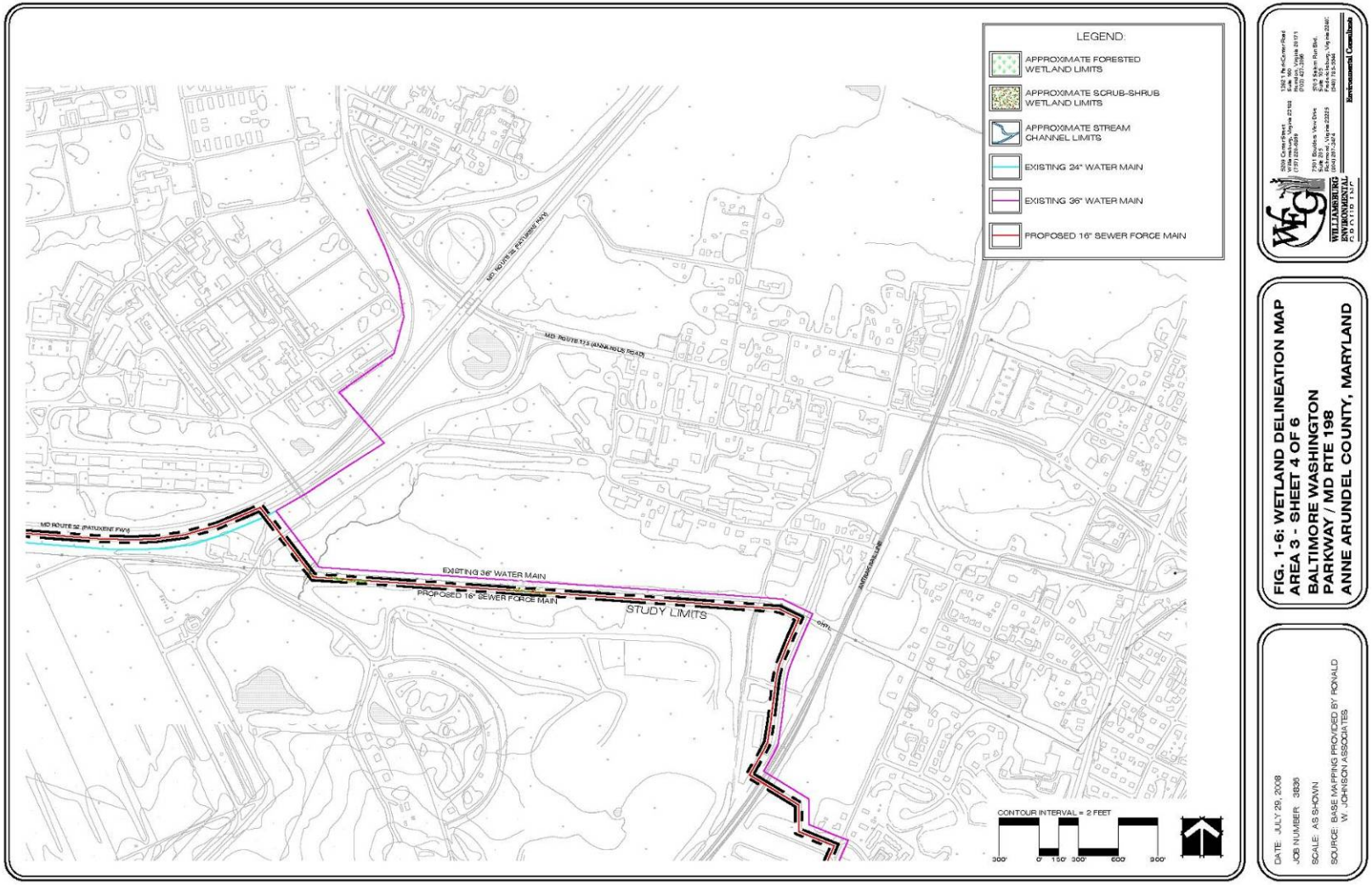

Figure 1-6 Wetland Delineation Map (4 of 6)

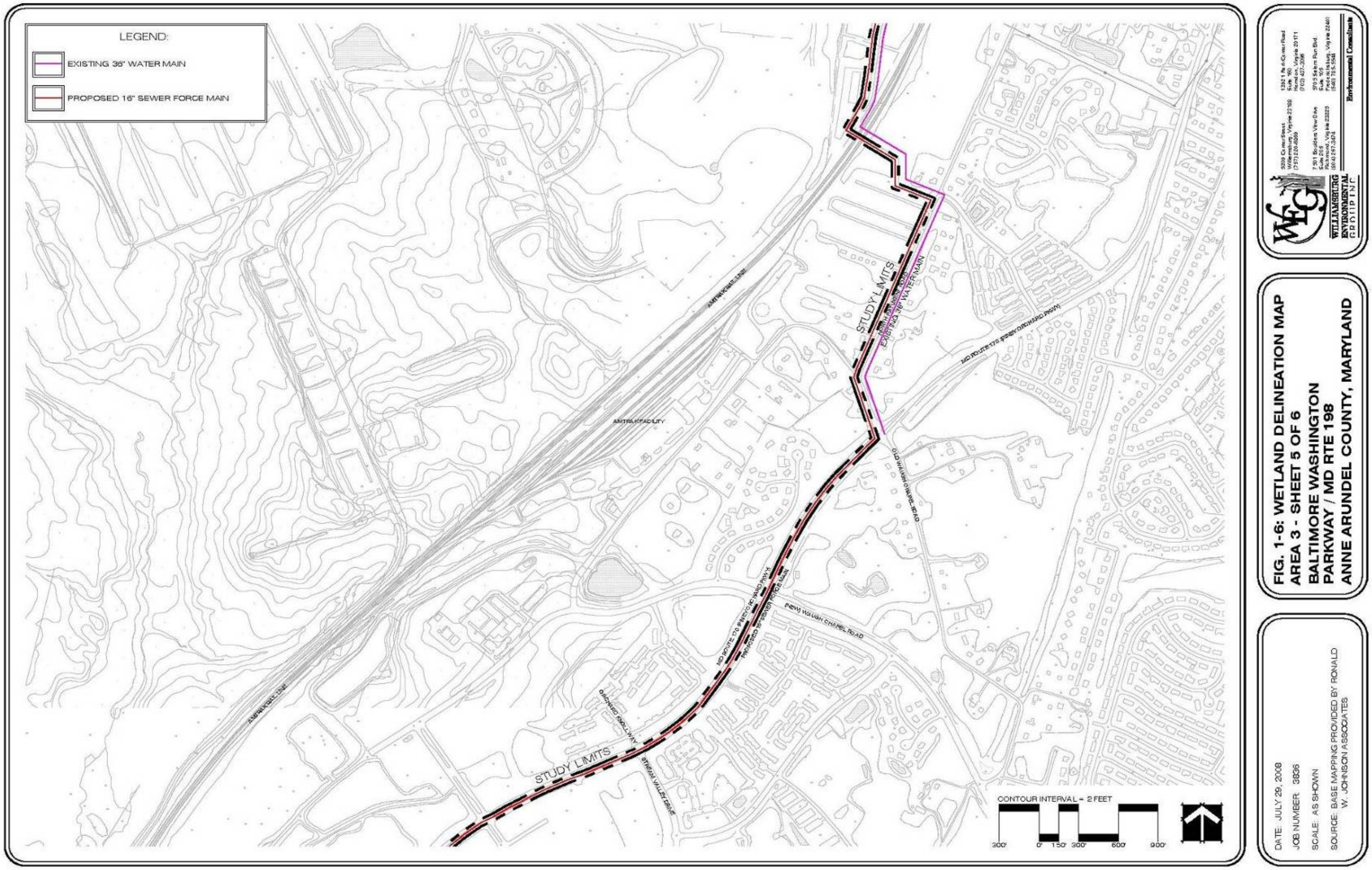

Figure 1-6 Wetland Delineation Map (5 of 6)

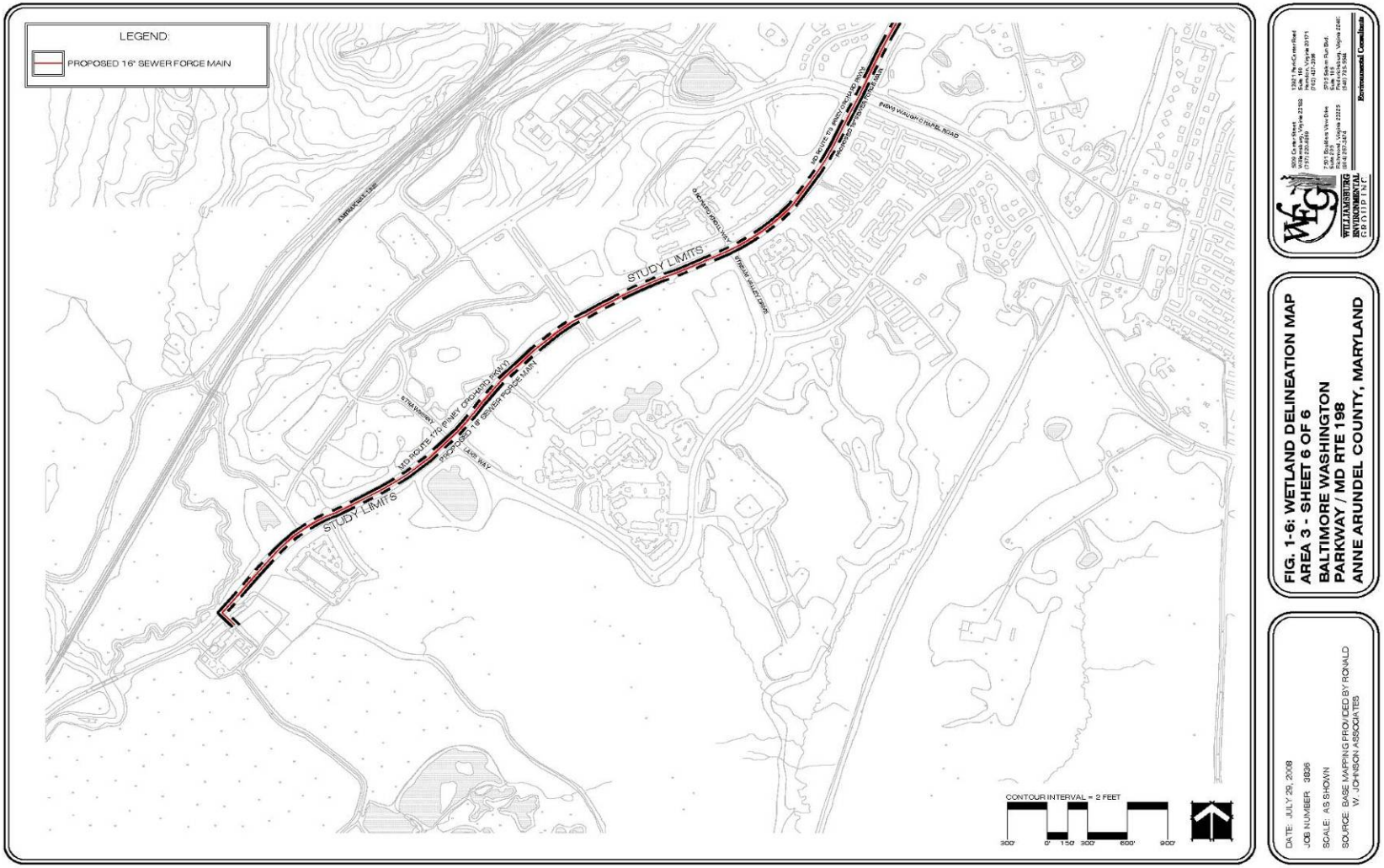

Figure 1-6 Wetland Delineation Map (6 of 6)

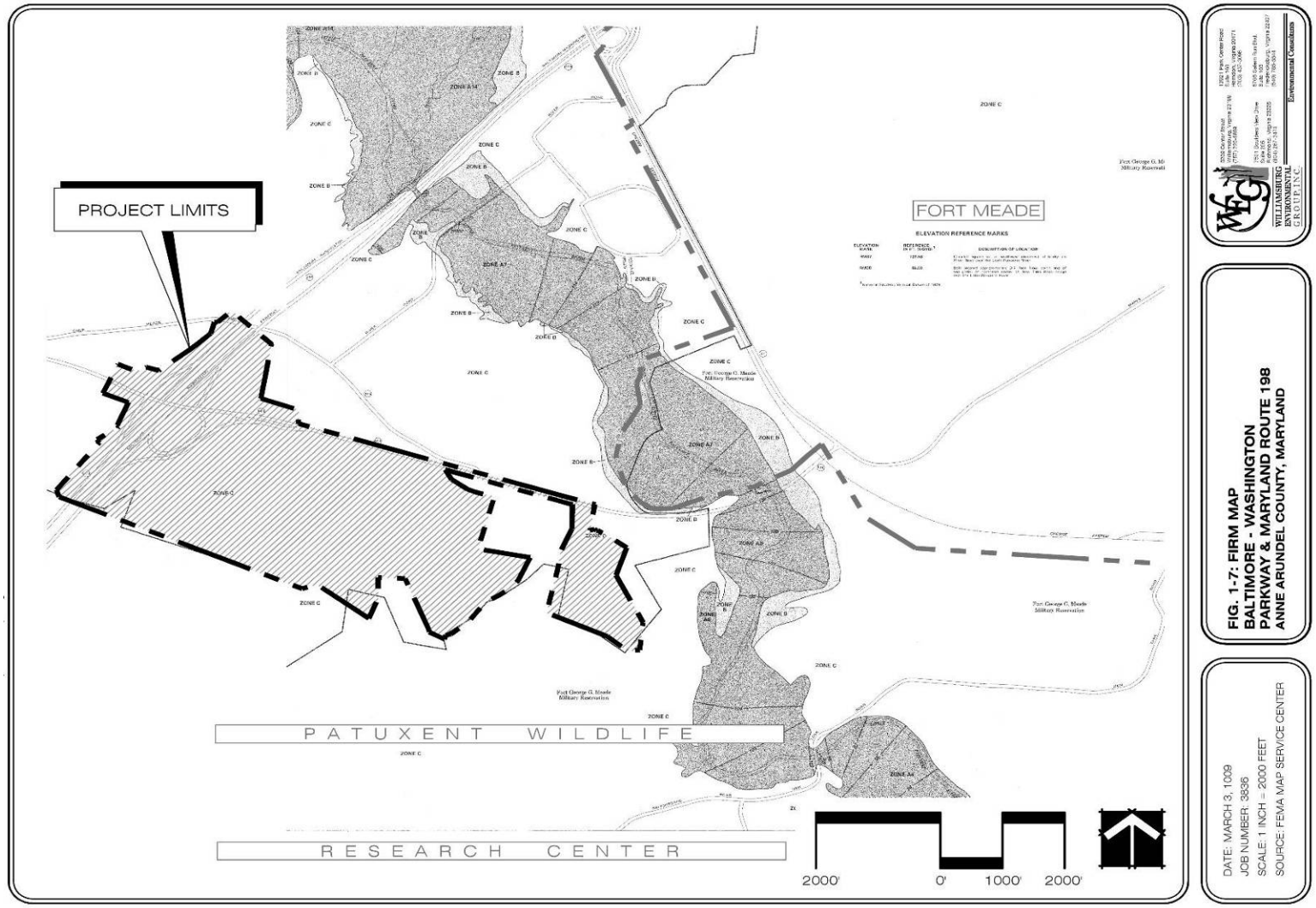

Figure 1-7 Firm Map

Socioeconomics

Neither the action nor the no action alternative would have a noticeable impact on the local or regional socioeconomics. While the provision of water and sewer is a basic service needed for the commercial or residential development, both can be met with or without involvement of the NPS. The Arundel Gateway property would be developed with either an easement from the NPS, the use of on-site wastewater facilities, or use of the facilities at Piney Orchard WWTP. The County's Comprehensive Plan is the major tool in determining rate and location of growth, along with the type of growth. The County's endorsement of development in this corridor creates the climate for growth. Both alternatives would have a negligible impact on overall growth in this corridor. As a result, this impact topic was dismissed from further consideration.

Health and Safety

Neither the action nor the no action alternative would have a noticeable impact on the health or safety of people using either the Parkway or the Refuge. Any construction along a roadway would require adequate signage and safety measures to protect both the workers and the traveling public. Since corridors are available to achieve both water and sewer service to the county residents with or without the NPS approval, the provision of service will not be a health issue. Both alternatives would have a negligible impact on health and safety in this corridor. As a result, this impact topic was dismissed from further consideration.

Cultural Resources

Ethnographic Resources, Museum Objects, Collections and Archives, Cultural Landscapes and Archaeology

For this study, efforts to identify cultural resources included a Phase I study of archaeology and architecture in and around the Parkway. The *Phase I Survey of the Proposed Installation of Underground Utility Lines at the Intersection of the Baltimore-Washington Parkway and the Maryland Route 198 in Anne Arundel County, Maryland* was conducted by Cultural Resources, Inc., in April 2008 (Appendix B). Both a background study and a field study were conducted.

The background study covered an area of two miles surrounding the project area. The archaeological field study was performed only on the Parkway right-of-way directly impacted by the proposed construction. A total of 39 archaeological resources were identified within a two-mile radius of the project area based on background information and the six archaeological surveys in the general vicinity to the project area. A single previously identified archaeological site, 18AN734, lies near the proposed project. This site is lithic scatted and previously determined to be ineligible for nomination to the National Register of Historic Places (NRHP).

The field archaeological investigations were undertaken in accordance with Section 106 of the National Historic Preservation Act (1966, as amended) and standards established in 36 CFR Part 800, the Advisory Council on Preservation's guidelines for implementing Section 106 (ACHO 1999). The fieldwork conformed to the Secretary of the Interior's *Standards and Guidelines for Archeology and Historic Preservation (USDI 1983)* and MHT's *Standards and Guidelines for Conducting Archeological Investigations in Maryland* (Shaffer and Cole 1994). The work was conducted by CRI staff members who meet or exceed the Secretary of Interior's Professional Qualifications Standards for Archaeology published at 36 CFR 61. The Phase I archaeological survey was conducted under an ARPA Permit (#08-NACE-002) administered by Dr. Stephen Potter of the National Capital Region of the National Park Service. Shovel testing was conducted at 50-foot intervals along transects that were spaced 25 feet apart, with three transects being placed in the utility line corridor.

During the Phase I study, no artifacts were recovered. Based on this information and the background information, no archaeological resources within NPS land would be impacted by the proposed action, and as a result this impact topic was dismissed from further consideration. In addition, the proposed project area does not contain any ethnographic resources, or museum objects or collection, or designated cultural landscape, as a result, these impact topics were also dismissed from further consideration.

[This page intentionally left blank.]

2.0 DESCRIPTION OF ALTERNATIVES

NEPA requires that federal agencies explore a range of reasonable alternatives. The alternatives under consideration must include the "no action" alternative as prescribed by 40 CFR 1502.14. Project alternatives may originate from the proponent agency, local government officials, members of the public at public meetings, or during the early stages of project development. Alternatives may also be developed in response to comments from coordinating or cooperating agencies. The alternatives analyzed in this document, in accordance with NEPA, are the result of design scoping and internal scoping. These alternatives were created based on the long-term plans of the County Department of Public Works, the Maryland City Water and Sewer Department, and the anticipated need for service in the developing MD 198 corridor.

2.1 No Action Alternative

The no action alternative evaluates the potential impacts anticipated from future development within the study area without the constructive use of the Parkway right-of-way. No action indicates that there will be no action taken by NPS to issue a right-of-way (ROW) permit for the extension of utilities across the Parkway. Without the ROW permit, two options exist; connecting to the existing public water line within the MD 198 corridor and either using an on-site sewage disposal system as public sewer is currently unavailable (see Figure 2-1), or extending sewer lines to the Piney Orchard WWTP. The no action alternative acknowledges that future development within the study area could occur in accordance with the current industrial and commercial zoning. This alternative assesses the potential impacts to the Parkway and the Refuge based upon future development within the study area as shown in Figure 2-1 under existing conditions using on-site sewage treatment. In addition, the no action alternative considers the potential impacts associated with future development under new zoning within the study area connecting to a new sewer line that would be extended northwesterly from the Piney Orchard WWTP. Piney Orchard is located approximately 5 miles southeast of the MD 198 intersection with the Parkway (see Figure 2-3).

2.2 Proposed Action Alternative (extension of utility lines through the parkway with addition preservation)

Under this alternative, the NPS would grant a ROW permit to the County for the installation, operation and maintenance of utilities across and beneath the Parkway. The proposed location of the ROW access including the proposed alignment of the utilities across the Parkway is shown on Figure 2-2. Utilities proposed to be installed beneath the Parkway via directional drilling include a water main and a sanitary sewer force main. Directional drilling would use small staging areas outside the Parkway where drill rigs would be placed and entry holes would be dug. From this staging area, small tunnels would be bored for the pipe placement. No grading work would occur on NPS property. Utility installation from the proposed pump station to the Parkway boundary would be installed by cutting an open trench alongside MD 198. Installation of the utility lines through the Parkway would be accomplished using directional drilling so that there are minimal impacts or traffic disturbance. The proposed 16-inch water main would connect the existing waterline located at the intersection of MD 198 and MD 32 from the east to the west of the Parkway. The new line would provide redundant service for the Maryland City service area. The proposed 16-inch force main would provide a sewer connection to the MD 198 corridor from the Maryland City Water Reclamation Facility, located west of Maryland City. The issuance of the ROW permit by NPS would be required for the initial installation of the lines and for providing the subsequent operation and maintenance of the utility lines.

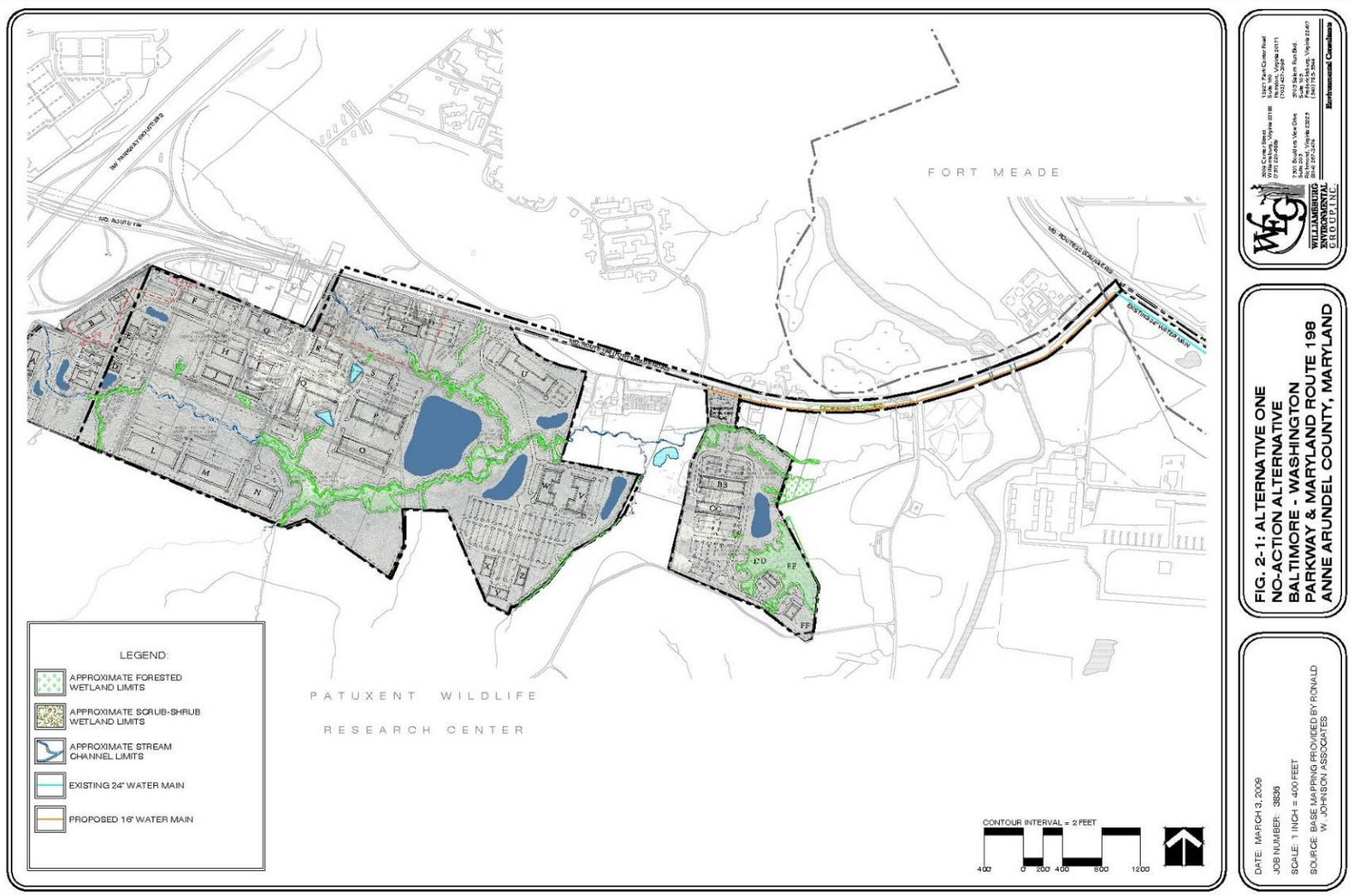

Figure 2-1 Alternative One – No Action Alternative

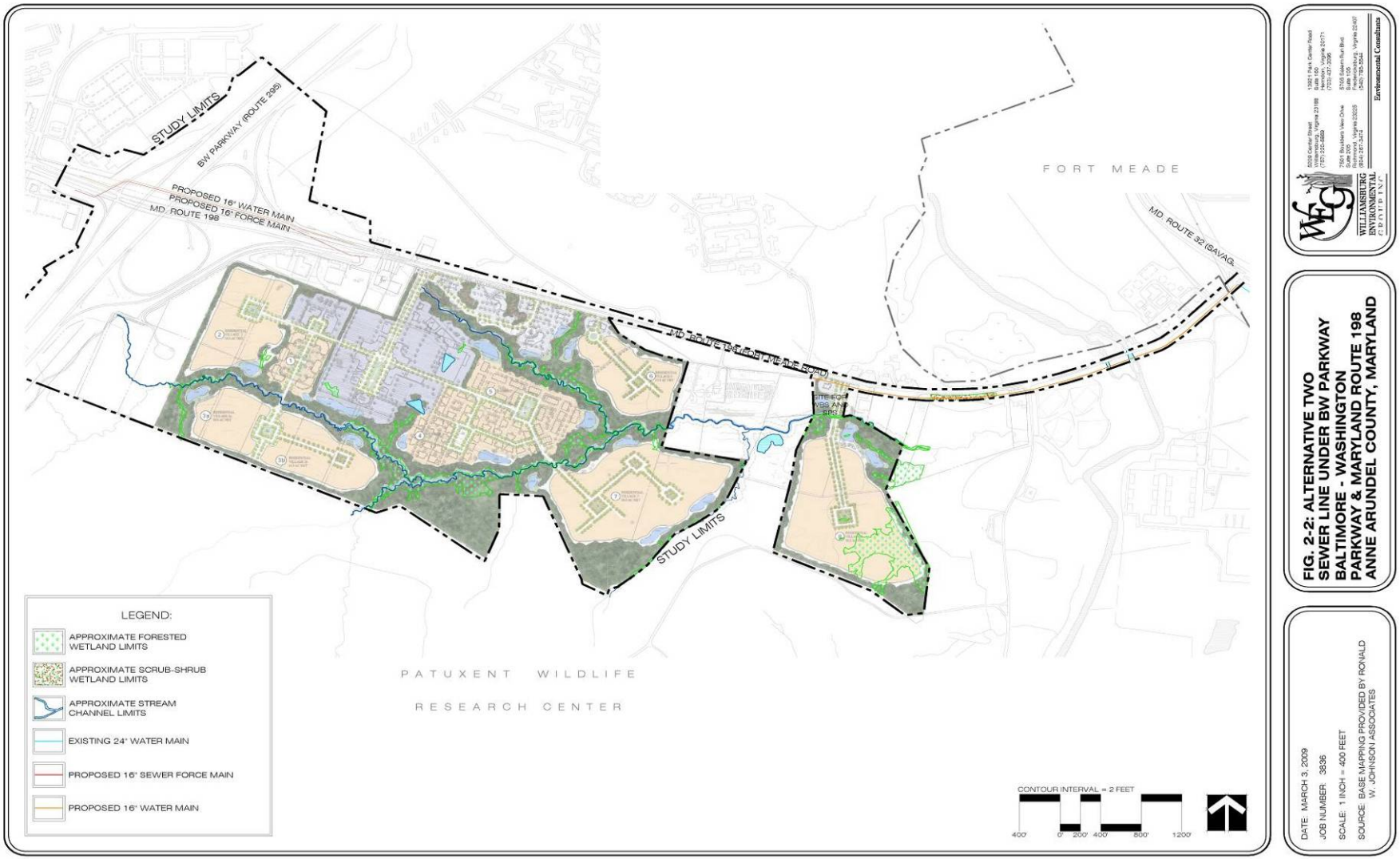

Figure 2-2 Alternative Two – Sewer Line Under Baltimore/Washington Parkway

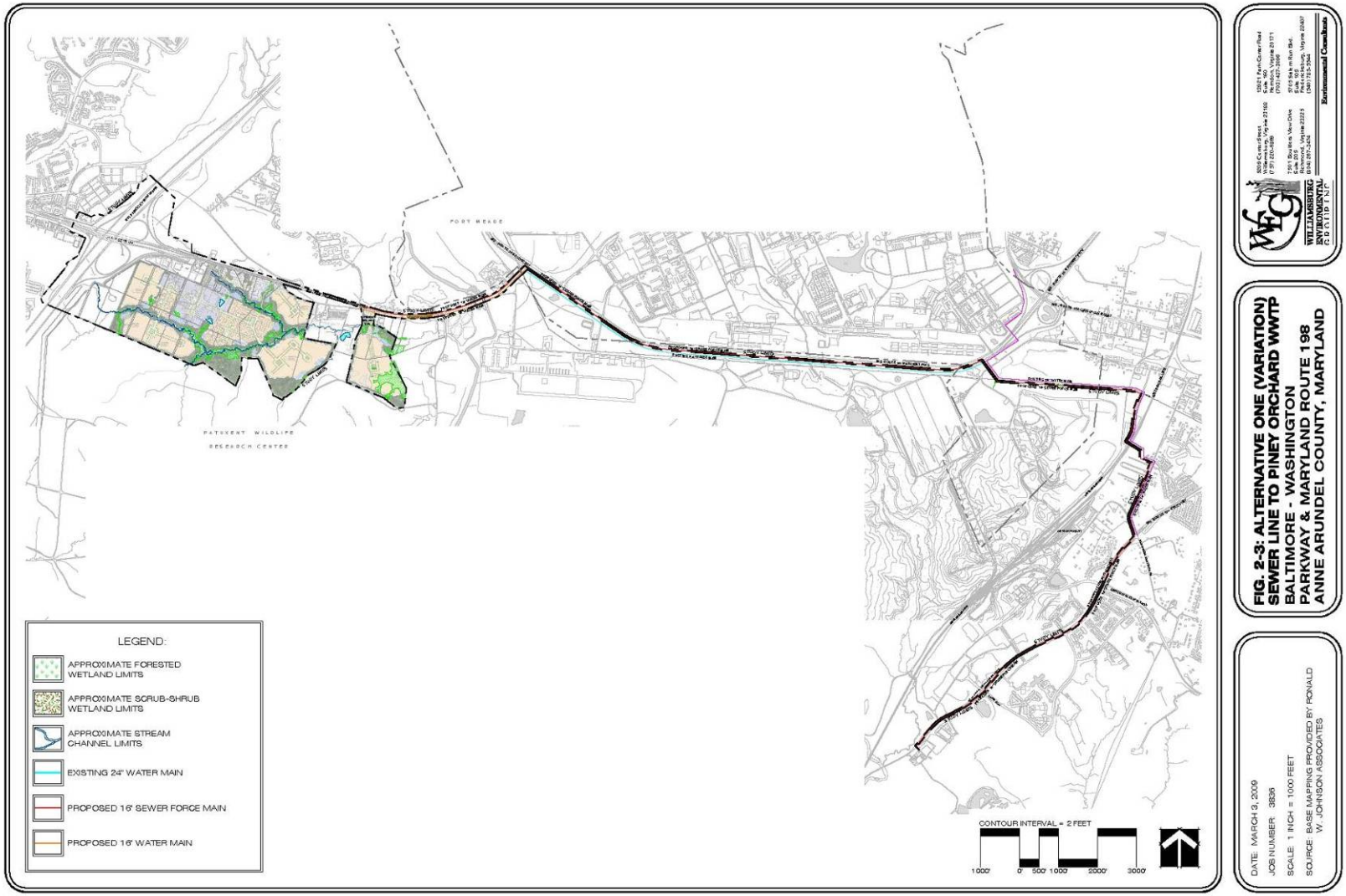

Figure 2-3 Alternative One (Variation) – Sewer Line to Piney Orchard WWTP

As proposed, NPS intends to condition its ROW permit to the County by imposing certain restrictions designed to preclude visual intrusions to the Parkway's viewshed and afford specific resource protections to the Refuge. The County, in turn, would enforce these requirements with users of the new sewer line. Specific restrictions include building setback and height restrictions, and guidelines regarding the exterior finishes of buildings constructed on neighboring properties located within specified distances from the Parkway boundary.

In addition to imposing building restrictions, NPS, in coordination with the U.S. Fish and Wildlife Service (FWS), would also seek to mitigate the potential impacts of land development through implementing a series of enhancements designed to protect, as well as supplement, the existing resources within the boundaries of the Parkway and the adjoining Refuge. Possible enhancements may include fencing along the Refuge boundary, land transfers and/or exchanges near the Refuge, stormwater management features to limit runoff to predevelopment conditions, improvements to Bald Eagle Drive at its crossing of the Little Patuxent River to minimize flood potential, and the creation of buffers preventing development within identified distances from the Refuge boundary. A water quality monitoring program would be created to ensure that future development within the project area keep the water quality within the Refuge within standards. Reforestation efforts on the neighboring private property associated with requirements of Maryland's Forest Conservation Act would be strategically located, preferably adjacent the refuge to minimize fragmentation of forest resources adjacent to the Refuge, if needed.

The project area is the Parkway ROW corridor and the adjacent parcels scheduled for development, also known as the Ribera Property, orArundel Gateway. In addition to impacts and activities directly related to the installation of public utilities, evaluation of the Proposed Action also examines cumulative impacts related to the utility connection. The cumulative impact analysis focuses on impacts resulting from the expansion of Ft. Meade, and the improvements along MD 198.

2.3 Mitigation Measures of the Action Alternative

The NPS places a strong emphasis on avoiding, minimizing and mitigating potentially adverse environmental impacts. To help insure the protection of natural and cultural resources and the quality of the visitor's experience, the NPS would insure that the following protective measures are implemented as part of the action alternative.

SOIL RESOURCES

- Maintain erosion and sedimentation controls according to all state and local regulations.
- Re-vegetate all disturbed soil in a timely manner.
- Remove all waste material to an approved upland waste site.

VISITOR USE AND EXPERIENCE

- Utility construction activity would be conducted as to not be visible from the Parkway.

WATER QUALITY

- The project would apply for registration coverage under the Maryland's NPDES General Permit for Construction Activity.
- Avoid impacts to streams associated with the utility placement where possible.
- Implement the water quality monitoring program.
- Restore any temporary impacts to streams to pre-existing contours and conditions as required by Maryland Department of the Environment (MDE) or US Army Corps of Engineers (USACE) permits.
- Minimize erosion using silt fence and/or erosion control methods in accordance with *Maryland Standards & Specifications for Soil Erosion & Sediment Control (*MDE 1994).

WETLANDS

- Restore any temporary impacts to wetlands to pre-existing contours and conditions as required by MDE or USACE permits.
- Obtain all state and federal permits for the temporary crossings along MD 198.

CULTURAL RESOURCES

- If during construction archaeological resources are discovered, all work in the immediate vicinity shall cease until such resources can be identified and documented and an appropriate mitigation strategy developed, if necessary. In the unlikely event that human remains, funerary objects, sacred objects or objects of cultural patrimony are discovered during construction, provisions outlined in the Native American Graves Protection and Repatriation Act (25USC3001) of 1990 would be followed.

VEGETATION

- Minimize cutting trees whenever possible along MD 198.
- Re-vegetate disturbed areas in a timely manner with native seed mix or plants.
- Ensure that all protection measures are clearly stated in the construction specifications and that workers be instructed to avoid conducting activities outside the construction zone.
- Adhere to the Forest Conservation Act and replant if necessary.
- Preclude development within specified distances from the Parkway.

TRANSPORTATION AND TRAFFIC

- Develop a traffic routing plan for the areas of MD 198 that would be affected by open trench construction.
- Develop a safety plan to protect motorists, pedestrians and construction workers during construction activities.

2.4 Alternatives Considered but Dismissed

The Council of Environmental Quality (CEQ) regulations for implementing NEPA require federal agencies explore and objectively evaluate all reasonable alternatives to the preferred alternative, and briefly discuss the rationale for eliminating any alternatives that were not considered in detail. This section describes those alternatives that were eliminated from further study and documents the rationale for their elimination. During the course of scoping, several alternatives were considered but deemed to be unreasonable and were not carried forward for analysis in this EA. Justification for eliminating these options from further analysis was based on the following factors:

- Technical or economic feasibility.
- Inability to meet project objectives or resolve need.
- Duplication with other, less environmentally damaging or less expensive alternatives.
- Conflict with an up-to-date and valid park plan, statement of purpose and significance, or other policy, such that a major change in the plan or policy would be needed to implement.
- Too great an environmental impact.

The following alternatives were considered but dismissed for the listed reasons.

Granting ROW without Gaining Protection

Similar to the action alternative, this alternative concerned granting the right-of-way permit for utility placement without the acquisition of additional Parkway protection in the form of buffers and building restrictions or additional protections for the Refuge. This option was rejected since there was no benefit to the NPS or FWS and did not meet the project objectives or resolve need.

Open Trenching in the Parkway

This proposed alternative suggested that the utilities be installed via open trenching. This alternative is the standard means of construction and is more cost effective than directional drilling. However, open trenching would involve closing the Parkway to traffic near the construction, re-routing traffic around the construction zone, removing pavement and landscaping, and replacing the pavement. A trench would be dug across the open space, landscaping and pavement of the Parkway. After the pipes are placed, the area would be backfilled. The natural areas would be reseeded, landscaping would be replaced and the roadway would be repaved.

This alternative was rejected because it would complicate traffic patterns unnecessarily in the congested DC Metro area and also deface the natural aesthetics of the Parkway during construction. The preservation of current, mature landscaping is preferable to having new, immature landscaping installed as a mitigation measure. This alternative was similar to the action alternative, which is less environmentally damaging.

2.5 The Environmentally Preferred Alternative

The environmentally preferred alternative is defined by the CEQ as the alternative that would promote the national environmental policy as expressed in NEPA Section 101. This includes:

1. Fulfilling the responsibilities of each generation as trustee of the environment for succeeding generations;
2. Assuring for all generations safe, healthful, productive, and aesthetically and culturally pleasing surroundings;
3. Attaining the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences;
4. Preserving important historic, cultural and natural aspects of our national heritage and maintaining, wherever possible, an environment that supports diversity and variety of individual choice;
5. Achieving a balance between population and resource use that would permit high standards of living and a wide sharing of life's amenities; and
6. Enhancing the quality of renewable resources and approaching the maximum attainable recycling of depletable resources (NEPA, Section 101, 42 USC § 4331).

The NPS is required to identify the environmentally preferred alternative in its NEPA document for public review and comment. The NPS, in accordance with the Department of the Interior policies contained in the Departmental Manual (516 DM4.10) and the Council on Environmental Quality's (CEQ) *NEPA's Forty Most Asked Questions*, defines the environmentally preferred alternative as the one that "causes the least damage to biological and physical environment". It is the alternative "which best protects, preserves, and enhances historic, cultural and natural resources" (Q6a).

After completing the analysis, the NPS has identified the action alternative as the environmentally preferred alternative because it best meets the CEQ's definition. This alternative provides new protection for the Parkway and Refuge that is not otherwise available. Table 2-1 compares how each alternative meets each criteria. A summary of the environmental consequences is provided in Table 2-2.

Table 2-1 Comparison of Alternatives

Criteria	No Action Alternative	Action Alternative
Fulfilling the responsibilities of each generation as trustee of the environmental for succeeding generations	No, adds no protections	Yes, adds protections
Assuring for all generations safe, healthful, productive, and aesthetically and culturally pleasing surroundings	No, adds no protections	Yes, adds protections
Attaining the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences;	No	Yes, adds public use without NPS property degradation
Preserving important historic, cultural and natural aspects of our national heritage and maintaining, wherever possible, an environment that supports diversity and variety of individual choice;	No, adds no protection	Yes, adds viewshed protection of NRHP property
Achieving a balance between population and resource use that would permit high standards of living and a wide sharing of life's amenities; and	No	Yes, adds public utilities while adding to the value of the Parkway through buffer additions.
Enhancing the quality of renewable resources and approaching the maximum attainable recycling of depletable resources (NEPA, Section 101).	N/A	N/A

Table 2-2 Summary of Potential Environmental Impacts of the Considered Alternatives

Resource Assessed	Alternative 1 - No Action Alternative	Alternative 2 – Action Alternative
Soils	The no action alternative could result in short- to long-term minor to moderate adverse impacts related to soil. Long-term minor to moderate adverse cumulative impacts could also occur. There would be no impairment of this resource under the no action alternative.	The utility line construction would result in short-term negligible adverse impacts from and the removal of soils via boring from NPS property. There would be long-term beneficial impacts as soils along the parkway are protected. Long-term minor to moderate adverse cumulative impacts could also occur. There would be no impairment of this resource under this alternative.
Visitors Use and Experience	The no action alternative would have a minor adverse impact since current zoning would allow land clearing and building construction up to the Parkway property boundary. There would also be long-term moderate adverse cumulative impacts.	The action alternative would have a beneficial impact by creating buffers and building restrictions that would protect the viewshed of the Parkway from adjacent development. The proposed actions would also result in long-term minor adverse cumulative impacts.
Water Quality	The no action alternative would have long-term minor adverse impacts on the Refuge since protections beyond state and local regulations could not be implemented to enhance water quality protection. There would also be long-term minor adverse cumulative impacts. There would be no impairment to water quality under this alternative.	The action alternative would require a plan to have no net increase in stormwater and extra monitoring beyond the state and local regulations. The proposed action would have a negligible impact on the Refuge. There would also be long-term negligible to minor adverse cumulative impacts. There would be no impairment to water quality under this alternative.
Historic Structures and Districts	The no action alternative could result in moderate adverse impact to the Parkway, which is listed on the National Register of Historic Places. There could also be long-term moderate adverse cumulative impacts. There would be no impairment to cultural resources under this alternative.	The action alternative would result in short-term negligible adverse impacts and long-term beneficial impacts to the cultural resources within the Parkway. There would also be long-term minor adverse cumulative impacts. There would be no impairment cultural resources under this alternative.
Vegetation	The no action alternative could have long-term moderate adverse impacts on vegetation. There could also be long-term moderate adverse cumulative impacts. There would be no impairment to vegetation under this alternative.	Alternative 2 would result in short-term negligible adverse impacts to vegetation from the installation of the utilities line beneath the Parkway and long-term minor adverse indirect impacts associated with the development that could occur within the project area. There would also be long-term moderate adverse cumulative impacts. There would be no impairment to vegetation under this alternative.
Wildlife and Habitat	The potential loss of wildlife habitat and indirect effects on adjacent habitat could result in long-term moderate adverse impacts on wildlife and habitat in the northern boundary of the Refuge. No RTE species are present in the project area. Development in the area could result in impacts to water quality, which could result in long-term minor adverse affect the state threatened glassy darter found downstream of the development. There could also be long-term moderate adverse cumulative impacts. There would be no impairment to wildlife and wildlife habitat under this alternative.	While the action alternative provides habitat protection along the Parkway and Refuge boundaries, there would be long-term negligible to minor adverse indirect impacts to wildlife and wildlife habitat within the project area from the development that could occur. In addition, there would also be long-term minor adverse cumulative impacts. No RTE species are present in the project area. Development in the area could result in impacts to water quality, which could result in long-term negligible to minor adverse affect the state threatened glassy darter found downstream of the development. There could also be long-term minor adverse cumulative impacts. There would be no impairment to wildlife and wildlife habitat under this alternative.

3.0 AFFECTED ENVIRONMENT

This section of the EA describes existing environmental conditions in the areas potentially affected by the alternatives evaluated. Potential effects are evaluated in terms of the following resource areas: soil resources, visitor use and experience, water quality, cultural resources wildlife and vegetation. Potential impacts to existing environmental conditions by implementing the no action or action alternatives are discussed in the "Environmental Consequences" section following the same order.

3.1 Soil Resources

Anne Arundel County lies within the center of Maryland. The County's land area is approximately 264,900 acres, or 414 square miles. The County is located in the mid-Atlantic Coastal Plain, east of the Fall Line and its topography varies from flat to steeply rolling, with elevation from sea level along the Chesapeake Bay to about 300 feet above sea level in the northwest, near the Parkway. The land along the Patuxent and Little Patuxent Rivers is flat in the north and moderately rolling in the south, with a number of sharp valleys incised by small streams running westward into the Patuxent River.

The general soil associations in this region is loamy and clayey land- Muirkirk-Evesboro association; nearly level to steep, well-drained loamy and clayey soils and excessively drained sandy soils. The Web Soil Survey, administered by the Natural Resource Conservation Service (NRCS), maps several soil types within the study areas. Hydrologic classifications for most of the mapped soil types are moderately well-drained to well-drained. Two mapped units (Fallsington sandy loam, Zekiah and Issue soils) within the project limits are classified by the NRCS as hydric (i.e., poorly drained) (NRCS, 2009).

The more focused areas of study are predominantly soil types with negligible to very high erosion hazard (Alloway, Downer, Fort Mott, and Issue). Sampling during field inspections confirms that the majority of soils within the areas of study are deep and loamy in texture, with no significant evidence of erosion present. None of the soil types mapped within the study areas are on slopes greater than fifteen percent (NRCS, 2009).

3.2 Visitors Use and Experience

Running between the eastern boundary of the District of Columbia and Baltimore, Maryland, the Parkway is a 29-mile route that opened for traffic in October 1954. It resulted from the combined efforts of federal and state governments. The cooperation linked the two metropolitan areas along the "fall line" where the Atlantic coastal plain meets the Piedmont region. Initially, the parkway crossed undeveloped land. Since then, considerable suburban growth, stimulated in part by the roadway, has occurred along the corridor. At present, the National Park Service manages the nineteen-mile section from MD 175 to the District boundary.

From its inception, the Parkway has been designed as a scenic highway featuring a landscaped buffer between the roadway and surrounding development. As the Parkway's manager, one of missions of NPS is to maintain this scenic character.

3.3 Water Quality

Water quality resources typically includes streams, wetlands and ponds in the project area and areas downstream which may be impacted due to secondary impacts. In this case, there are no water resources documented within the Parkway on the proposed utility corridor. However, water from precipitation events does flow from the Parkway eastward into offsite water resources, such as those located within the Refuge and Little Patuxent River.

The water resources within the Refuge are most likely to be impacted by degradation due to construction. A stormwater management study, included in Appendix C, was undertaken to assess pre- and post-development watershed factors that may influence water quality due to runoff during and after construction. The Pre-Development Watershed Analysis Map, included in Appendix C, delineates the

existing watershed draining into the Refuge at Node A. It includes areas west of the Parkway, the Arundel Gateway development, portions of the Refuge and a small area north of MD 198.

The *Final 2008 Integrated Report of Surface Water Quality in Maryland* excerpt below indicates all County waters are biologically impaired based on the reduced fish and aquatic insect communities, including the Little Patuxent River and the upper reaches of the Patuxent River, which are in the general study area. 3-1 lists the impaired waters in the county and Figure 3-2 shows the project area.

Anne Arundel County Watersheds Impaired for Biology 12/12/2006

303(d) Listing Year	Basin Name	Basin Code	Listing Category	Subbasin Name	Subbasin Code	Impairment Category
2002	Baltimore Harbor	02130903	5			Biological
2004	Baltimore Harbor	02130903	5			Biological
2004	Bodkin Creek	02130902	5	MAIN CR UT1	021309021000	Biological
2002	Little Patuxent River	02131105	5	LITTLE PATUXENT R, LITTLE PATUXENT R UT3 & UT4	021311050957	Biological
2002	Little Patuxent River	02131105	5	UN TRIB TO PLUMTREE BR	021311050956	Biological
2006	Little Patuxent River	02131105	5	HAMMOND BR		Biological
2004	Lower Chesapeake Bay	02139998	5			Biological

Figure 3-1. Impaired Waters
(Final 2008 Integrated Report of Surface Water Quality in Maryland)

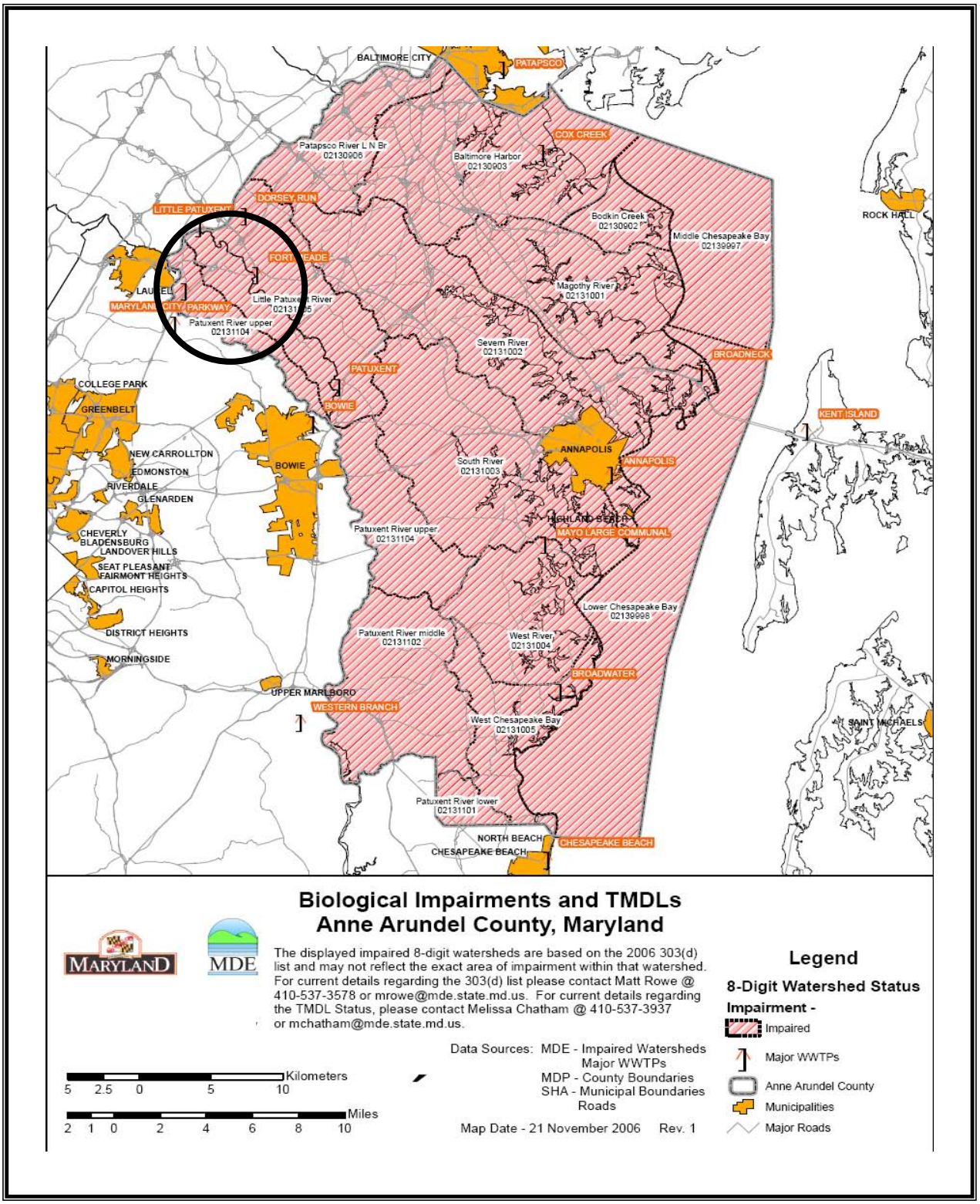

Figure 3-2 Water Quality Map of Anne Arundel County - 2006
(http:www.mde.maryland.gov/assets/document/hb1141/Anne_Arundel/anne_biological.pdf)

3.4 Cultural Resources

As part of this EA, efforts to identify cultural resources included a Phase I study of archaeology and architecture in and around the Parkway. The Phase I Survey of the Proposed Installation of Underground Utility Lines at the Intersection of the Baltimore-Washington Parkway and the Maryland Route 198 in Anne Arundel County, Maryland was conducted by Cultural Resources, Inc., in April 2008 (Appendix B). Both a background study and a field study were conducted. The background study covered an area of two miles surrounding the project area. The archaeological field study was performed only on the Parkway right-of-way that would be directly impacted by the proposed construction.

Archaeological, ethnographic resources, and museum objects, collections and archives have been considered and previously dismissed from further study. No ethnographic resources or museum objects, collections or archives were discovered nor are involved in this project. Based on the Phase I Survey, no archaeological sites would be disrupted.

3.5 Historic Districts and Structures

A total of 13 architectural resources have been identified within a two-mile radius of the project area. The identified resources include the Parkway itself as a historic district; a mid- nineteenth century plantation house and slave quarters; a mid-nineteenth century railroad bed; a late nineteenth century dwelling; a late nineteenth-early twentieth century historic district; a church, lodge and cemetery dating to the early twentieth century; an early twentieth century racetrack; an early twentieth century historic district; a mid-twentieth century airfield building; and any early to mid-twentieth century military base.

The Parkway, Grasslands Plantation, St. Jacob's lodge and cemetery, Bacontown Historic District and the DC Children's Center have either been listed or deemed eligible for listing. Three identified items, the Annapolis and Elkridge Railroad prism, Laurel Racetrack, and Building T-92 at Tipton Airfield, have been deemed Not Eligible. The remaining six resources have not been evaluated for listing on the NRHP.

The Maryland Historical Trust and the National Register of Historic Places Registration Form document that the Baltimore-Washington Parkway was listed on May 9th, 1991 as Inventory No.: AA-5, PG: 69-26 in Anne Arundel County and Prince Georges County Maryland. The federally owned portion of the Parkway is coterminous with its historic right-of-way boundaries: extending northeast from the eastern border of the District of Columbia near the Anacostia River, through Prince Georges and Anne Arundel Counties, Maryland, encompassing 1,353 acres. The 19-mile federally owned and maintained section of the Parkway terminates just below Jessup Road (MD 175) at the Baltimore City line. The irregular right-of-way is 400 to 800 feet wide, and contains the dual-lane roadway, a variable-width median of 15 to 200 feet, a flanking buffer of natural forest and cultivated native vegetation, scores of culverts, and 22 bridges. The terrain is composed of generally forested, gentle hills with modest vistas but no outstanding scenic features. Although promoted since the early 20th century, construction was not initiated by the Federal Bureau of Public Roads until 1942, with most development occurring from 1950-1954. Its design as a defense highway and alternative commuter route thus blends parkway characteristics of landscape architecture and materials with post-war economies, so that stylistically it represents the end of a 50-year continuum of parkway construction. The Parkway, as a historic district, includes many contributing elements of landscape architecture and approximately 125 contributing structures, including bridges and numerous culverts with decorated headwalls.

The Parkway achieves state and local significance in the areas of transportation and landscape architecture. It is associated with urban development of the National Capital as a federal center, it exemplifies, the last period of construction for this type of road, and is the only fully developed parkway of its kind in Maryland. It achieves extraordinary significance as a contributing element to the National Capital Park and Parkway system developed during the first half of the 20th century, although the parkway itself was constructed largely between 1950-1954, some features are less than 50 years old. Although conceived and promoted from the 1920s, construction of the Parkway was not initiated until 1942. Its enabling legislation intends for the Parkway to serve as a major scenic artery within the park and

parkway system of the nation's capital; as a formal entrance to the city of Washington, D.C.; as a defense/military route among suburban federal installations and the city; and as a contributing element to the commercial and residential development of the Baltimore-Washington corridor. The parkway maintains original integrity of setting, design, and associated characteristic of the earliest parkways designed for pleasure motoring--the preservation of natural topography and vegetation for scenic purposes coupled with "high-speed" elements of modern freeway design.

3.5 Vegetation

The report of the on-site vegetation assessment conducted by WEG during January, February, and April 2008 is included in Appendix E, *Vegetation Inventory for Three Areas Near the Parkway at MD 198*. The vegetation community for all of Area 1 can be classified as Oak-Yellow Poplar-Beech hardwood association. Vegetation communities within the Arundel Gateway tract may be classified by six general classifications including: Oak-Yellow Poplar-Beech, Red Maple-Sweetgum, Virginia Pine-Sweetgum-Red Maple, scrub-shrub wetland, and maintained clearings (see Figure 3-3 on the following page). The majority of the Arundel Gateway site has been described as being part of the Oak-Yellow Poplar-Beech community and typically consists of trees ranging from 10-18 inches diameter at breast height (dbh). The typical canopy dominants of this community includes scarlet oak, (*Quercus coccinea*), white oak (*Quercus alba*), yellow poplar (*Liriodendron tulipfera*) and American beech (*Fagus grandifolia*). The offsite area towards Piney Orchard WWTP is mostly contained within the ROW of several roadways and only small areas of scrub-shrub wetlands were identified.

3.6 Wildlife and Wildlife Habitat

The privately ownedArundel Gateway property located within the study area and adjacent to the Refuge provides a transition zone between the Refuge and the MD 198 corridor. In its current state, this privately owned tract extends the habitat of the Refuge. Much of the study area is currently forested, but is also impacted by its proximity to existing development including the Parkway and development along MD 198.

Areas surrounding the project area are developed, with the exception of the Refuge to the south. Because of the proximity to major roadways, wildlife inhabiting the study area are species tolerant of suburban environments. These species include white-tailed deer (*Odocoileus virginianus*), woodchuck (*Marmota monax*), opossum (*Didelphis virginiana*), red fox (*Vulpes vulpes*), and various species of mice, moles and voles (Hotchkiss, 1947). Birds typical to developed areas include American robin (*Zenaida macroura*), house sparrow (*Passer domesticus*), Canada goose (*Branta canadensis)*, turkey vulture (*Carthartes aura*), and catbird (*Dumetella carolinensis*) (Hotchkiss, 1947).

The Refuge is a unique area within Maryland and the mid-Atlantic in general. The North Tract of the Refuge consists of 8,100 acres and because the Refuge is such a large area of contiguous forest, it is often used as a nesting area for migratory species not typically found in developed areas. The Refuge provides habitat for bald eagles (*Haliaeetus leucocephalus)*, warblers, and other raptors such as the Broad-winged (*Buteo platypterus)* and Red-shouldered hawk (*Buteo lineatus)*. It is one of the few locations in the mid-Atlantic region providing habitat for interior nesting bird species.

The project was coordinated with the US Fish and Wildlife Service Chesapeake Bay Field Office. Based on their confirmation letter, no federally listed threatened or endangered species are present in the project area. The Section 7 certification letter is included in Appendix D.

A letter from MDNR (Appendix D) documents that MDNR-WHS’s database indicates that there are records for the glassy darter (Etheostoma vitreum) immediately downstream of the proposed project site in nearby Little Patuxent River. The letter also listed protection recommendations to minimize impacts from development in the vicinity of rare fish species.

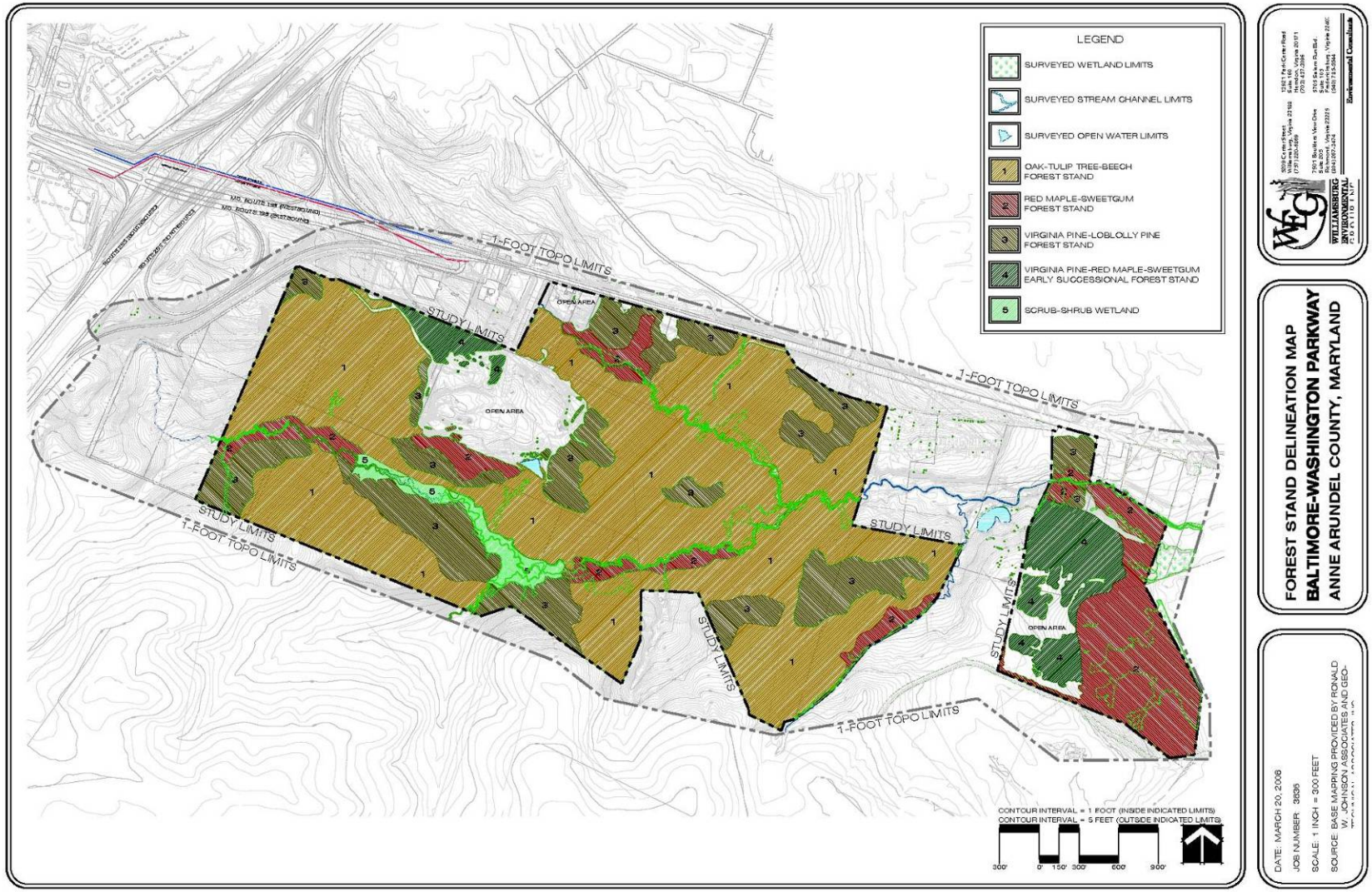

Figure 3-3 Forest Stand Delineation Map

4.0 ENVIRONMENTAL CONSEQUENCES

This chapter addresses the potential impacts relative to existing conditions discussed in Chapter 4 "Affected Environment" for each of the alternatives. Anticipated impacts of the action alternative are compared to those of the no action alternative to determine the scope and degree of impacts to resources. In the absence of quantitative data, best professional judgment was used.

Potential impacts of the alternatives are described in terms of type (beneficial or adverse); context (local, regional); duration (short- or long-term); intensity (negligible, minor, moderate, major). Definitions of those descriptors include:

Beneficial: A positive change in the condition or appearance of the resource or a change that moves the resources toward a desired condition.

Adverse: A change that declines, degrades, and/or moves the resources away from a desired condition or detracts from its appearance or condition.

Context: Context is the affect environment within which an impact would occur, such as local, park-wide, regional, global, affected interests, society as a whole, or any combination of these. Context is variable and depends on the circumstances involved with each impact. As such, the impact analysis determines context, not visa versa.

Duration: The duration of the impact is described as short-term or long-term. Duration is variable with each impact topic; therefore, definitions related to each topic are provided in the specific impact analysis narrative.

Intensity: Because definition of impact intensity (negligible, minor, moderate, major) varies by impact topic, intensity definitions are provided separately for each topic analyzed.

4.1 Cumulative Impacts

NEPA regulations require an assessment of cumulative impacts in the decision-making process for federal projects and federal actions. Cumulative impacts are defined as "the impact on the environmental that results from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such actions" (40 CFR 1508.7). Cumulative effect can result from individually minor, but collectively major actions that take place over a period of time.

Cumulative impacts are considered for all alternatives, including the No Action alternative. Cumulative impacts were determined by combining the impacts of the alternative being considered with other past, present and foreseeable future actions. The following actions and plans were identified as having potential for impacts to the resources that were evaluated in this EA. Figure 4-1 shows the Cumulative Impact Study Area.

Fort George G. Meade and BRAC Expansion

Fort Meade became an active U.S. Army installation in 1917. Authorized by an Act of Congress in May 1917, it was one of 16 cantonments built for troops drafted for the war with the Central Powers in Europe. The site was selected June 23, 1917 because of its close proximity to the railroad, Port Baltimore and Washington D.C. The cost for construction was $18 million and the land sold for $37 per acre in 1917. The Post was originally named Camp Meade for Maj. Gen. George Gordon Meade, whose victory at the Battle of Gettysburg proved a major factor in turning the tide of the Civil War in favor of the North (Ft. Meade).

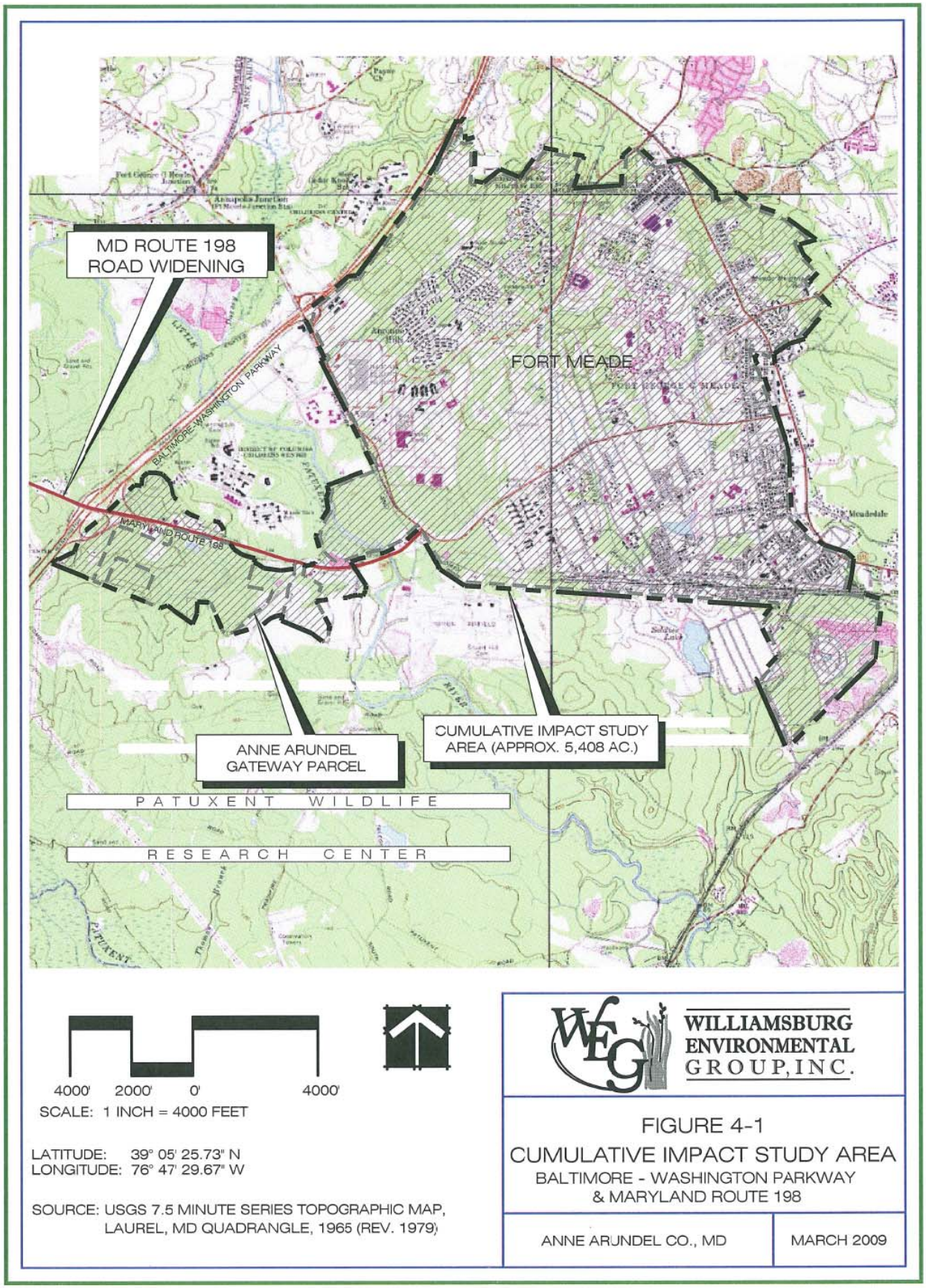

Figure 4-1 Cumulative Impact Study Area

Today, the base focuses on national security and intelligence. The combination of U.S. Army personnel and the National Security Agency, which has its headquarters at Fort Meade, makes the two entities the largest employers in Maryland. Fort Meade employs about 39,000 military and civilian workers and contractors. It currently has the fourth-largest workforce of any Army installation in the U.S., and its workforce is set to grow by at least 5,000 personnel by 2010 due to the 2005 Base Realignment and Closure (BRAC)**.** Fort Meade is virtually a city in itself. The base consists of 5,415 acres with 65.5 miles of paved roads, 3.3 miles of secondary roads, and about 1,300 buildings. Ft. Meade is located to the northeast of the project area, and contributes heavily to the growth, development, socioeconomic, employment and traffic volumes in the area.

On September 8, 2005, the Defense Base Closure and Realignment Commission (BRAC Commission) recommended a set of domestic realignment and closure actions. These recommendations were approved by the President on September 15, 2005, and forwarded to Congress (DoD 2005) and the recommendations became law (DoD 2006). The BRAC Commission recommendations must now be implemented as provided for in the Defense Base Closure and Realignment Act of 1990 (Public Law 101-510) as amended.

Fort Meade is a permanent US Army installation located about midway between Baltimore, MD and Washington, D.C., encompassing 5,067 acres in Anne Arundel County, MD. Fort Meade supports more than 80 tenant organizations, including all military services and several federal agencies. The BRAC Commission recommended that three major activities relocate to Fort Meade by 2011: the Defense Information Systems Agency (DISA), the Defense Media Activity (DMA) and the Adjudication Activities co-location offices.

In addition to the BRAC realignment actions, Fort Meade proposes to use the Army's Enhanced Use Lease (EUL) program to implement actions that would involve leasing two parcels of non-excess land to a private developer for 50 years. The private developer would in turn provide in kind services to include developing and constructing recreational facilities on a third parcel of Army land for Army use. The developer would construct administrative buildings for an estimated 10,000 personnel.

The overall plan for Fort Meade involves the arrival of about 5,695 workforce personnel (660 military, 3,324 civilian, 1,711 A-Es) and the construction of new facilities, including the aforementioned administrative buildings and two 18-hole golf courses.

MD 198 Road Widening

MD 198 is on the State's Secondary System of highways and is functionally classified as an Urban Other Principal Arterial under the Federal Functional Classification System. MD 198 is an East-West route that extends from Montgomery County to the west, through the City of Laurel in Prince George's County and terminates at Fort Meade at the eastern end of the project limits. As part of the regional grid, it connects to major north-south arterials such at US29, I-95, US 1 and MD 295. MD 198 had grade separated and at-grade interchanges with local roads and access roads to Fort Meade.

In a letter dated June 27, 2006, the Anne Arundel County Executive requested that the State Highway Administration (SHA) initiate a planning study for MD 198 to assess road capacity and needed improvements to handle the expected increased use from the BRAC expansion. The purpose of the project is to provide increased vehicular, bicycle and pedestrian safety while supporting the existing and planned development of the County. Options include dual-laning the roadway and improving ramps, interchanges and bridges. A location/design public hearing is planned for Fall of 2009.

Arundel Gateway Property Development

The Arundel Gateway property is currently zoned for industrial and development that can occur on the property with no rezoning efforts or coordination with the NPS or FWS. The owners of the property prefer to develop the property as a mixed-use development, having commercial and residential components. In order to realize this mixed use, rezoning is necessary.

Existing zoning within the study area consists of a mix of industrial and commercial uses. The majority of land along the MD 198 corridor east of the Parkway is zoned W-1 or Industrial Park. W-1 zoning is intended for the development of "clean" industry that would result in minimal nuisance. Developments are intended to have a landscaped park-like setting and include offices, research and development laboratories, and light manufacturing. W-1 zoning can also allow for office supply stores, restaurants, and hotels or motels. Maximum lot coverage is 75 percent. W-1 zoning does not have a building height limit but requires minimal setbacks based upon building height. (Anne Arundel County Zoning Code, 2005)

In addition to W-1, a small area near the interchange is zoned C-4 or Highway Commercial. The Highway Commercial zoning is intended for large-scale auto-oriented retail and service businesses to be located along major traffic routes. Highway Commercial zoning allows numerous commercial uses of C-3 along with the auto-oriented uses. Maximum lot coverage is 85 percent and building height is restricted to 60 feet.

Patuxent Wildlife Research Refuge

Patuxent Wildlife Research Refuge (Refuge) is one of over 540 refuges in the National Wildlife Refuge System administered by the U.S. Fish and Wildlife Service (FWS). The National Wildlife Refuge System is the world's largest network of lands and waters dedicated to protecting wildlife and their habitat (FWS).

Established in 1936 by executive order of President Franklin D. Roosevelt, the Patuxent Research Refuge is the Nation's only National Wildlife Refuge established to support wildlife research. Today most of the research on the refuge is conducted by the US Geological Survey (USGS) through the Patuxent Wildlife Research Center (FWS).

With land surrounding the Patuxent and Little Patuxent Rivers between Washington, D.C. and Baltimore, MD, the Refuge has grown from the original 2,670 acres to its present size of 12,841 acres and encompasses land formerly managed by the Departments of Agriculture and Defense. Throughout decades of change, Patuxent's mission of conserving and protecting the nation's wildlife and habitat through research and wildlife management techniques has remained virtually unchanged.

Patuxent Research Refuge is divided into three areas: 1) North Tract, which offers hunting, fishing, wildlife observation, trails, and many interpretive programs; 2) Central Tract, where the offices and study sites of the many research biologists are located at the USGS Patuxent Wildlife Research Center; and 3) South Tract, where the National Wildlife Visitor Center and its trails are located. The National Wildlife Visitor Center and North Tract are the only areas open for visitor activities (FWS).

4.2 Impairment Analysis

The NPS *2006 Management Policies* (NPS 2006) require the analysis of potential effects to determine whether or not proposed action would impact park resources, but also to determine whether those actions would impair park resources. The fundamental purpose of the National Park System as established by the Organic Act and reaffirmed by the General Authorities Act, as amended, begins with a mandate to conserve park resources and values. These laws provide the NPS the management discretion to allow impacts to park resources and values in order to fulfill the purposes of the park, as long as the impact does not constitute an impairment of the affected resources and values. NPS managers must always seek ways to avoid or minimize to the greatest degree practicable, adversely impacting park resources or values.

The impairment prohibited by the Organic Act and the General Authorities Act is an impact, in the professional judgment of the responsible NPS manager, that harms the integrity of the park resources or values, including opportunities that otherwise would be present for the enjoyment of those resources or values. Whether an impact meets this definition depends on the particular resources and values that would be affected; the severity, duration, and timing of the impact; the direct and indirect effects of the impact; and the cumulative effects of the incremental impact of the proposed action when added to the other past, present and reasonably foreseeable future actions. An impact to any park resource or value may constitute

impairment. However, an impact would be more likely to constitute an impairment when such impact imparts a major or severe adverse effect upon a resource or value whose conservation is:

- Necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park
- Key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park, or
- Identified as a goal in the park's general management plan or other relevant NPS planning documents.

Impairment may result from NPS activities associated with managing the park, visitor activities, or activities undertaken by contractors, and others operating in the park. An impairment determination is included in the conclusion statement for all impact topics related to natural resources. Impairment determinations are not made for visitor use or enjoyment, health and safety, socioeconomics or park operations as these factors are not considered as park values or resources.

4.3 Soil Resources

Methodologies and Assumptions

Potential impacts to soil resources were assessed based on the extent of the disturbance to natural undisturbed soils, the potential for soil erosion resulting from disturbance, and limitations associated with the soils. Analysis of possible impacts to soil resources was based upon a physical inspection of the resource within the project area, review of the existing literature and information provided by the NPS and other agencies

Study Area

The study area for these resources contains the Parkway right-of way, the Refuge, and privately owned properties immediately adjacent to both.

Impact Thresholds

The following thresholds were used to determine the magnitude of impacts on soil resources:

Negligible – Soil resources would not be impacted or the impact would be below or at the lower levels of detection. Any impacts to geology, topography and soils would be slight.

Minor – Impacts to soil resources would be detectible. Impacts to undisturbed areas would be small. Mitigation would be needed to offset adverse impacts and would be relatively simple to implement and would likely be successful.

Moderate – Impacts to soil resources would be readily apparent and would result in a change to the soil character over a relatively wide area, Mitigation measures would be necessary to offset adverse impacts and would likely be successful.

Major – Impacts to soil resources would be readily apparent and substantially change the character of these resources over a large area both within and outside of the park. Mitigation measures necessary to offset the adverse impacts would be needed, extensive and their success would not be guaranteed.

Duration – Short-term impacts occur during the implementation of the alternative; long-term impacts extend beyond implementation of the alternative.

Impacts of Alternative 1 – No Action Alternative

Analysis. Under this alternative, there would be no grading, earth moving or soil disturbance within the Parkway or Refuge, so there would be no direct impact. However, the adjoiningArundel Gateway parcel could develop as a light industrial development, employing mass grading and earthmoving. The

construction of the anticipated industrial park development could result in the disturbance of a significant portion of the property in achieving the maximum lot coverage of 75 percent of the entire site as allowed by current zoning. Similarly, under the no action alternative, the potential disturbed area for the mixed-use development with access to the Piney Orchard WWTP would be based on a maximum residential density of seven to 22 units per acre for Mixed Use Districts (MXD). As part of either development scenario, soils loss would be mitigated by the proper installation and maintenance of erosion and sediment control measures. Construction activities would compact soil, disturb and modify soil layer structure and expose soils, increasing the overall potential for erosion. Soil productivity would decline in disturbed areas and be eliminated for those areas within the footprint of the new development. As a result, there would be both short- and long-term minor to moderate adverse impacts to soils from the no action alternative.

Cumulative Impacts. Impacts to soil resources are site specific and can be affected by development within or adjacent to the study area. Earthmoving activities to construct new buildings and golf course at Fort Meade, and to widen MD 198, could increase erosion and permanently reduce and/or eliminate soil productively in the areas of development. The implementation of these projects, plus the Arundel Gateway development and utility line placement outside the Parkway, in combination with the impacts from the no action alternative could result in long-term minor to moderate adverse cumulative impacts.

Conclusion. Implementation of the no action alternative could result in short- to long-term minor to moderate adverse impacts related to soil erosion impacts. Construction activities would compact soil, disturb soil layer structure and modified, and expose soils, increasing the overall potential for erosion. Soil productivity would decline in disturbed areas and be eliminated for those areas within the footprint of the new development. Long-term minor to moderate adverse cumulative impacts could also occur. There would be no impairment of this resource under the no action alternative.

Impacts of Alternative 2 –Action Alternative

Analysis. The action alternative would utilize directional boring to install utility pipes under the Parkway. The proposed 16-inch water main would connect the existing waterline located east of the Parkway at the intersection of MD 198 and MD 32 to serve homes and businesses west of the Parkway. The new line would provide redundant water service to Maryland City. The proposed 16-inch force main would provide a sewer connection to the MD 198 corridor from the Maryland City Water Reclamation Facility, located west of Maryland City. Installation of the proposed utility lines by means of directional bore technology would impart negligible adverse impacts to resources within the Parkway, since no evidence of utility work would result. The drill rigs and other construction equipment would be placed outside the Parkway, and soil removed from the small tunnels created would be taken to an approved upland location. The utility work would occur some distance from the Refuge, again resulting in short-term negligible adverse impacts.

Prior to issuance of the ROW permit, the NPS would require the County to implement specific building restrictions (i.e. height and setbacks) for properties within specified distances from the Parkway that will connect to the public utilities. The Arundel Gateway developer, the FWS and the NPS would agree upon a series of mitigation measures to add protections to the Parkway and the Refuge. Such mitigation measures include items such as fencing, buffer retention and land transfers, along with provisions for water quality monitoring. As a condition of the proposed mixed-use development connecting to the sewer line under the Parkway, land transfers/buffer areas would be provided to the Parkway and the Refuge, providing vegetative screening, erosion prevention along with the areas that would be protected under the Forest Conservation Act. As a result, the soil condition within this designated buffer would be protected and would not likely be degraded.

An erosion control plan will be created for the utility line placement, as well as any other earthmoving project in the vicinity. These plans will assure that soil dislodged by construction will be retained on-site using silt fence, diversion berms, sedimentation basins and other approved methodologies. This will not

only keep soil on-site, but will prevent it from entering waterways that flow into the Refuge, avoiding stream sedimentation. The water quality plan, proposed under Alternative 2, will assure that the silt has not entered waterways. Regular inspections of the erosion control measures along with the water quality monitoring will allow immediate corrections if problems occur.

Cumulative Impacts. Impacts to soils from projects occurring within and adjacent to the project area would be the same as those discussed under the no action alternative. The potential would still exist that construction activities and development on these sites could increase erosion and permanently reduce and/or eliminate soil productively in the areas of development. The implementation of these projects, in combination with the short-term negligible adverse impacts from Alternative 2 could result in long-term minor to moderate adverse cumulative impacts.

Conclusion. Implementation of the action alternative would result in short-term negligible adverse impacts from the installation of the new utilities lines; however, it would also add protection for the Parkway and Refuge due to mitigation offered to secure the ROW agreement. There would also be long-term minor to moderate adverse cumulative impacts from the proposed development at Fort Meade and the MD 198 widening, resulting in long-term minor to moderate adverse cumulative impacts could also occur. There would be no impairment to soil resources under Alternative 2.

4.4 Visitor Use and Experience

Methodologies and Assumptions

Impacts to visitor use and experience were determined by considering the effect of the existing conditions and the proposed construction of the utility lines on the overall experience of the Parkway and Refuge patrons.

Study Area

The study area for visitor's use and experience contains the Parkway and the Refuge.

Impact Thresholds

The following thresholds were defined:

Negligible – Visitors would likely be unaware of impacts associated with the implementation of the alternative. There would be no noticeable change in visitor use and experience or in any defined indicators of visitor satisfaction or behavior.

Minor – Changes in visitor use and/or experience would be slight and detectible, but would not appreciably limit or enhance critical characteristics or the visitor experience. Visitor satisfaction would remain stable.

Moderate – Few critical characteristics of the desired visitor experience would change. The number of participants engaging in a specified activity would be altered. Some visitors who desire their continued use and enjoyment of the activity/visitor experience might be required to pursue their choices in other available local or regional areas. Visitor satisfaction would begin to either decline or increase.

Major – Multiple critical characteristics of the desired visitor experience would change and/or the number of participant engaging in an activity would be greatly reduced or increased. Visitors who desire their continued use and enjoyment of the activity/visitor experience would be required to pursue their choices in other available local or regional areas. Visitor satisfaction would markedly decline or increase.

Duration – Short-term impacts would be immediate, occurring during the implementation of the alternative. Long-term impacts would persist after implementation of the alternative.

Impacts of Alternative 1 – No Action Alternative

Analysis. W-1 zoning would not impose building heights or mandate a forested buffer to protect the viewshed along the Parkway, therefore, construction that would occur within the project area would likely be visible from the parkway and would detract from its scenic qualities and disrupt the viewer's experience, resulting in long-term, minor adverse impacts.

Cumulative Impacts. The BRAC expansion of Fort Meade and the widening of MD 198 would likely result in increased traffic within the Parkway corridor, which in turn may affect the experience of those people who chose the Parkway for its scenic qualities. In addition, the widening of MD 198 could affect the Refuge near Wildlife Loop's intersection with MD198, depending upon the type of improvements and the side to which widening would occur. Although this is a small portion of the Refuge, the possibility exists for the loss of trees and other vegetation, a change in the appearance of the Refuge entrance, and a loss in land due to the road expansion. These impacts, when added to the impacts of the no action alternative would result in long-term moderate adverse cumulative impacts to visitor use and experience.

Conclusion. Implementation of the no action alternative would result in long-term, minor adverse impacts upon the Parkway and the Refuge due to visual changes around the edges of both resources where they border the Arundel Gateway Development. When added to the impacts from the other development in the area, there would be long-term moderate adverse cumulative impacts.

Alternative 2 – Action Alternative

Analysis. The placement of the utility lines under the Parkway would no pose a direct impact upon the visitor use or experience. There would be no disruption in vehicular traffic, and none of the work would be visible from the Parkway or the Refuge.

As a condition of granting the ROW easement, the NPS would stipulate that the owner of property located within specifically identified distances from the Parkway proposing to connect to the proposed utility lines would first need to agree in writing to certain restrictions designed to protect the Parkway's viewshed. Such restrictions would include building setbacks, height limits, and guidelines regarding the exterior finishes of buildings constructed on neighboring properties located within specified distances from the Parkway ROW boundary. For properties located beyond these identified parameters, no restrictions would apply. The NPS has established proposed buffer areas alongside the Parkway's eastern boundary. Figure 4-2 shows the proposed areas where no new structures would be allowed, and areas of proposed height restrictions of 45 feet and 75 feet respectively.

Portions of the proposed mixed-use development (Anne Arundel Gateway II) within specified disctances of the Parkway ROW and utilizing the sewer connection under the Parkway would have to meet all of the NPS requirements for protection of the viewshed from the Parkway. These requirements would include building setback and height restrictions, and guidelines regarding the exterior finishes of buildings. These setbacks and height restrictions will result in an enhancement of the forested buffer along the Parkway that will preserve the visitor experience of being in a landscaped parkway setting. This impact is considered long-term and beneficial.

Cumulative Impacts. The BRAC expansion of Fort Meade and the widening of MD 198 would likely result in increased traffic within the Parkway corridor, which in turn may affect the experience of those people who chose the Parkway for its scenic qualities. In addition, the widening of MD 198 could affect the Refuge near Wildlife Loop's intersection with MD 198, depending upon the type of improvements and the side to which widening would occur. Although this is a small portion of the Refuge, the possibility exists for the loss of trees and other vegetation, a change in the appearance of the Refuge entrance, and a loss in land due to the road expansion. These impacts, when added to the impacts of the Alternative 2 would result in long-term minor adverse cumulative impacts to visitor use and experience.

Conclusion. The action alternative would have a beneficial impact by creating buffers and building restrictions that would protect the viewshed of the Parkway from adjacent development. The proposed actions would also result in long-term minor adverse cumulative impacts.

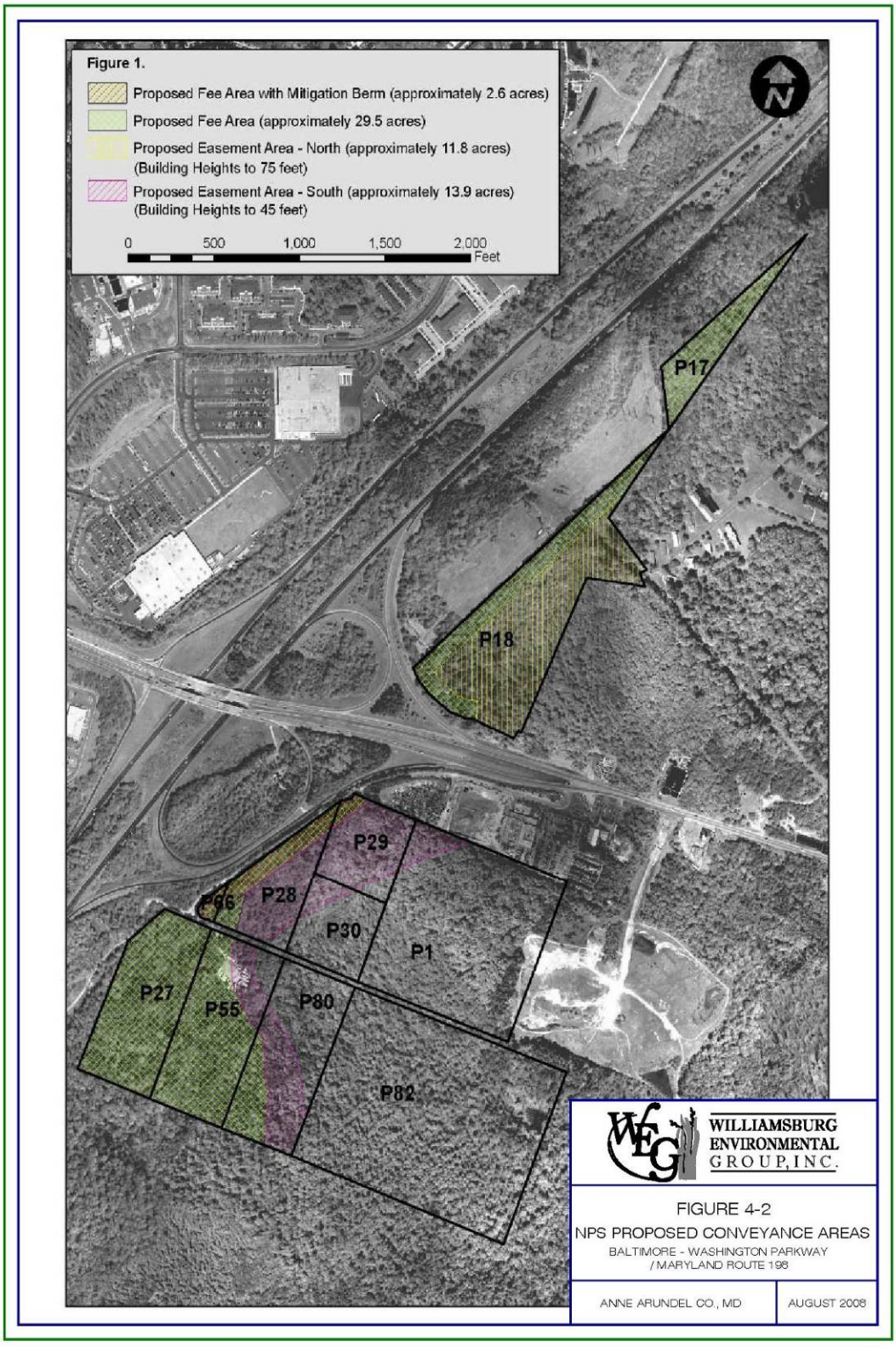

Figure 4-2 Preliminary Post Development Drainage Analysis – No Action

4.5 Water Quality

Methodologies and Assumption

The NPS 2006 Management Policies state that the NPS would "take all necessary actions to maintain or restore the quality of surface waters and ground waters within the parks consistent with the Clean Water Act and all other applicable federal, state and local laws and regulations" (NPS 2006, sec 4.6.3)

A water quality standard defines the water quality goals of a water body by designating uses to be made of the water, setting minimum criteria to protect the uses, preventing degradation of water quality through anti-degradation provisions. This anti-degradation policy is only one portion of a water quality standard. Part of this policy [40 CFR 131.12(a)(2)] strives to maintain water quality at existing levels if it is already better that the minimum criteria. Anti-degradation should not be interpreted to mean that "no degradation" can or would occur, as even in the most pristine waters, degradation may be allowed for certain pollutants as long as it is temporary and short-term.

Other considerations in assessing the magnitude of water quality are the effect on those resources dependent on a certain quality or condition of water. Sensitive aquatic organisms, submerged aquatic vegetation, riparian areas and wetlands are impacted by changes in water quality from direct and indirect sources.

Study Area

The study area encompassed the portion of the watershed located east of the Parkway and north of the Refuge. Also included within the study area is a small area north of MD 198, the siter of the currently proposed Arundel Gateway mixed-use development and several additional small parcels along the southern boundary of MD 198.

Impact Thresholds

The following thresholds were used to determine the magnitude of impacts on surface waters:

Negligible – Impacts (chemical, physical, biological) would not be detectable, would be within desired water quality standards or criteria, and would be within historical or desired water quality conditions. Modification of natural stream channel and flow characteristics would be below detection.

Minor – Impacts (chemical, physical, biological) would be detectable but would be within desired water quality standards or criteria and within historical or desired water quality conditions. Modification of natural stream channel would be detectable and would measurably alter stream flows. Mitigation, if needed, would be simple and successful.

Moderate – Impacts (chemical, physical, biological) would be detectable and historical baseline or desired water quality conditions would be temporarily altered; however, overall water quality would remain within regulatory standards. Modification of the natural stream channel would be readily apparent and result in changes to in-stream flow characteristics during high flow or low flow conditions. Mitigation measures to offset potential adverse impacts could be extensive, but would be successful.

Major - Impacts (chemical, physical, biological) would be detectable and would be frequently altered from the historical baseline or desired water quality conditions, and/or chemical, physical or biological water quality standards or criteria would temporarily be slightly and singularly exceeded. Modification of the natural stream channel would be readily apparent and would cause substantial changes to in-stream flow characteristics. Mitigation measures to offset potential adverse impacts would be extensive and their success could not be guaranteed.

Duration – Short-term impacts occur during all or part of alternative implementation; long-term impacts extend beyond implementation of the alternative.

Impacts of Alternative 1 – No Action Alternative

Analysis. One of the main concerns associated with any development within the study area is the impact that an increase in stormwater would have on the water resources within the Refuge and on the Little Patuxent River. To determine the potential impact, WEG conducted a watershed analysis, included in Appendix C, to evaluate hydrologic impacts near the Refuge. Fieldwork undertaken to consider the direct impacts was limited to three areas totaling approximately 365 acres. Area 1 contains the proposed alignment for the utility crossing under the Parkway north of MD 198, Area 2 is the Arundel Gateway development, and Area 3 contains the proposed sewer force main alignment from the proposed development to the Piney Orchard WWTP.

For purposes of the analysis, the major and minor subwatershed limits were divided into multiple sub catchments, draining to specified node locations. Four main subwatersheds (A1-A4) and sub catchments (DA 1-9) were identified within the overall watershed draining to node A. Node A encompasses almost all of the cumulative impact study area and over 90 percent of the proposed development within Area 2 (Anne Arundel Gateway II), and was selected for hydrologic analysis in order to evaluate potential development related hydrologic impacts to the adjacent Refuge. Node A also includes the location that FWS has identified as the main problem area for flooding of Bald Eagle Drive.

Based on the preliminary stormwater calculations and analysis of the post development conditions, it appears that sufficient stormwater storage volume could be provided to meet existing state and local stormwater requirements for either scenario of the no build alternative. However, based on the preliminary stormwater management calculations and preliminary analysis, it appears that the distribution of stormwater ponds, as currently designed, is inadequate to provide channel protection from erosive velocities caused by increased impervious cover. A more detailed hydrologic study would be required for a detailed stormwater design, and a modification of the plan to add sufficient Best Management Practices (BMPs) would likely be necessary. The proposed concept plan, as currently designed, may not provide sufficient storage on site in a distributed manner such that all proposed areas of development would drain to a BMP, which could result in increased runoff at Node A. No protections for stormwater quantity and quality would be provided beyond the state and local requirements that may not be sufficient to address the FWS's unique concerns.

The design manual recommends using Environmental Site Design (ESD) techniques to the Maximum Extent Practicable (MEP) to satisfy the sizing criteria. Based on the provisions of the Code of Maryland Regulations (COMAR 26.17.01 and 26.17.02), all jurisdictions within Maryland must implement a stormwater management program to control the quality and quantity of stormwater runoff resulting from any new development. Based on a preliminary assessment of state requirements (a detailed assessment in consideration of USE zones would be needed for further information) the stormwater criteria are based on (4) main criteria, water quality volume, groundwater recharge volume, channel protection volume, and overbank flood volume.

If the proposed stormwater management techniques are not sufficient to effectively manage stormwater in a manner that does not increase overland runoff or erosion, water quality within the watershed could be degraded. These adverse impacts to water quality however, would potentially only occur during storm events and would be minor and of short duration, and would not likely exceed the historical water quality conditions within the watershed.

Cumulative Analysis. Widening and improving MD 198 and the Fort Meade expansion prompted by BRAC expansion would add impervious surface to the study area. The majority of Fort Meade and part of MD 198 lie outside of the Little Patuxent River drainage area studied and should not cumulatively impact this drainage area. It is assumed that throughout the MSD198 widening and Fort Meade expansion all stormwater regulations would be followed for their construction. This alternative, along with cumulative impacts, would have long-term minor adverse impacts for the Refuge

Conclusion. The no action alternative would lack pre-treatment facilities that could assist in retaining predevelopment hydrologic conditions such as time of concentration and initial abstraction. This alternative would have long-term minor adverse impacts for the water quality within the Refuge. There would also be long-term minor adverse cumulative impacts. There would be no impairment to water quality under this alternative.

Impacts of Alternative 2 – Action Alternative

Analysis. Based on the preliminary stormwater calculations analysis, it appears that the pre-development hydrologic characteristics can be maintained at Node A by utilizing a hybrid stormwater management approach consisting of conventional Best Management Practices (BMPs) and Low Impact Development (LID) techniques as quantified in the preliminary stormwater calculations. Detailed hydrologic analysis, stormwater master planning and BMP/LID design would be necessary to confirm post development peak runoff rates and volumes do not exceed pre-development levels.

No increase in stormwater impacts to the Refuge and the Little Patuxent River would result from the proposed mixed-use development if the hybrid stormwater management plan is implemented correctly. The stormwater plan would be designed to maintain runoff at pre-existing conditions as required by state and local regulations and would propose an adequate distribution of facilities as recommended in the referenced ESD techniques. Improvements to Bald Eagle Drive and the culvert by the North Tract's entrance gate to minimize flood potential have been identified as additional protections to be provided in connection with the sewer line extension.

As part of the agreement with the NPS and FWS, the owners of the Arundel Gateway have offered a water quality monitoring plan that will examine various factors before, during and after construction to ensure that the integrity of the water quality is maintained. The plan includes multiple sampling points flowing into and out ofArundel Gateway. Data gathered will include temperature, pH, dissolved oxygen, suspended solids, nitrate, nitrite and total phosphorus. In addition, streamflow information will be collected to document any changes in channel cross-sections or depth. This monitoring plan will help insure that the water quality leaving the site will not negatively impact the Refuge's water or other water resources downstream. Should a problem be detected, corrective action can be taken immediately.

Cumulative Analysis. Widening and improving MD 198 and the Fort Meade expansion prompted by BRAC would add impervious surface to the study area. The majority of Fort Meade and part of MD 198 lie outside of the Little Patuxent River drainage area studied and should not cumulatively impact this drainage area. It is assumed that throughout the MD 198 widening and Fort Meade expansion all stormwater regulations would be followed for their construction. By implementing a hybrid plan at Arundel Gateway that utilizes both structural and non-structural facilities, it is anticipated that the proposed ESD techniques would increase infiltration, encourage vegetative nutrient uptake, and create functional landscape areas that serve as habitat enhancements as well as treatment mechanisms. As a result, there would long-term negligible to minor adverse cumulative impacts to water quality.

Conclusion. Because no increase in stormwater impacts would result for the proposed plan, and the protections offered extend beyond state and local stormwater requirement, this action Alternative is considered to have a negligible adverse impact on the Refuge. There would be no impairment to water quality under this alternative.

4.6 Cultural Resources – Historic Structures and Districts

Methodologies and Assumptions

The Parkway is considered a historic structure and is listed on the National Register of Historic Places (NRHP). Its significance is listed as a historic district for landscape architecture and as a transportation related parkway. The landscaped appearance of the Parkway is of paramount importance when considering the integrity of the parkland. For purposes of analyzing potential impacts to historic structures and districts, the thresholds of change for the intensity of an impact are defined as follows:

Negligible – The impact would be at the lowest level of detection or barely perceptible and not measurable. For purposes of section 106, the determination of effect would be *no adverse impact.*

Minor – Adverse impact – The impact would not noticeably affect the character defining features of a structure, building, or district listed on the NRHP. For purposes of section 106, the determination of effect would be *no adverse effect*.

Moderate – Adverse impact – The impact would alter character defining feature(s) of the structure, building, or districts listed on the NRHP and would diminish the integrity of the resource to the extent that its national register eligibility would be jeopardized.

For purposes of Section 106, the determination of effect would be *adverse effect.* A memorandum of agreement (MOA) is executed among the applicant, the NPS and applicable state historic preservation officer and, if necessary, the Advisory Council on Historic Preservation in accordance with 36 CFR 800.6(b). Measures identified in the MOA to minimize or mitigate adverse impacts reduce the intensity of impact under NEPA from major to moderate.

Major – Adverse impact – The impact would alter a character defining feature of the structure , building, or district diminishing the integrity of the resources to the extent that it is no longer eligible to be listed on the national register. For purposes of Section 106, the determination of effect would be *adverse effect*. Measures to minimize or mitigate adverse impacts cannot be agreed upon and the applicant, NPS, and applicable state historic preservation officer and/or Advisory Council are unable to negotiate and execute a memorandum of agreement in accordance with 36 CFR 800.6(b).

Duration - Short-term impacts would last for the duration of construction activities associated with the proposed action; long-term impacts would last beyond the construction activities.

Impacts of Alternative 1 – No Action Alternative

Analysis. The no action alternative would not place any restrictions to development of the adjoining private property within the project area, and would allow development to occur up to the property line of the Parkway. The development that could occur under this alternative would not occur directly on NPS property and would not physically alter the historic district or any historic structures associated with the Parkway. However, the contributing scenic qualities that lie adjacent to the Parkway (i.e., forested areas, gentle hills with modest vistas) could be altered within the project area as industrial development would become more visible from the Parkway. This potential loss of the contributing scenic qualities could adversely impact the designated historic district and may necessitate the need to develop a MOA between the developer, NPS, and the Maryland SHPO's office to develop mitigations to minimize these impacts to the extent possible. As a result, under the no action alternative, if development were to occur up to the property line of the parkway, there could be long-term moderate adverse impacts to the historic district within the project area.

The Grasslands Plantation, St. Jacob's lodge and cemetery, and the Bacontown Historic District are not within sight of the project and would not be directly or indirectly impacted by any development within the project area. The DC Children's Center is near the project but is separated from both the BW Parkway and MD 198 by forested areas. No impacts are anticipated for the Children's Center.

Cumulative Impacts. Widening and/or improving MD 198 would extend across the Parkway. While final plans are not known, it is understood that the state of Maryland would have to comply with Section 106 and all regulations regarding the NPS and use of parkland for transportation projects. It can be assumed that the MD 198 project would directly impact the Parkway because they intersect, but the impacts may be long-term and minor, depending on the final scope of work and the length of the construction schedule. Fort Meade, as a federal installation, is also obligated to follow the federal environmental review process and mitigate any potential impacts to historic resources. All construction and land use associated with the proposed BRAC expansion would follow NEPA and Section 106

regulations, protecting the cultural resources in the area. The BRAC expansion, due to its distance from the Parkway, would not directly impact the Parkway as a historic resource. These impacts in combination with the potential impacts of the no action alternative could result in long-term moderate adverse cumulative impacts.

Conclusion. Allowing development to occur up to the property line of the Parkway could adversely impact the contributing scenic qualities to this historic district, resulting in long-term moderate adverse impacts. There could also be long-term moderate adverse cumulative impacts associated with the widening of MD 198 and activities associated with the Fort Meade BRAC expansion. However, there would be no impairment of any resource.

Alternative 2 – Action Alternative

Analysis. The action alternative would allow the proposed utilities to be constructed under the Parkway with certain restrictions upon the developer(s), through the County zoning system, to provide a vegetative buffer along to Parkway within the project area. The purpose of these buffers is to help protect scenic quality and historic significance of the parkway. This would be accomplished by restricting the removal of vegetation on certain parcels and limiting building heights so that they are not visible from the Parkway. Restricting the clearing of vegetation on certain parcels and limiting building heights would result in long-term beneficial impacts as lasting protection of the contributing scenic qualities of the Baltimore Washington Parkway Historic District is provided.

To determine the extent of the building height restrictions, a viewshed analysis utilizing red weather balloons was conducted by CRI in cooperation with the NPS, FWS and WEG on March 26 and April 3, 2008, prior to leaf out (Appendix F). Starting from the surveyed limits of the Parkway ROW, offsets were drawn on a map at 200 feet, 600 feet and 1,000 feet (Figure 4-3). The NPS selected seven balloon locations in areas of higher topography that represented the maximum potential visual impacts to the Parkway corridor. Balloons were initially flown at a height of 100 feet for marking the location above the tree line and then lowered to heights of 45 feet and 25 feet (building height restrictions proposed by the NPS) for purposes of the visual effects evaluation. Photographs were taken from six locations along the Parkway specified by the NPS toward each of the balloon tests in order to assess the potential visual effects.

The project area is currently wooded and the results of the balloon tests and visual effects evaluation indicate that visibility would be minimized by the presence of the tree buffer even at the narrowest proposed buffer of 200 feet. The existing mature trees are approximately 60 feet tall in most places and would significantly minimize the view of any development. Only Balloon #1 at a 200-foot offset was visible below the tree line at a height of 45 feet. The trees were not fully foliated during this study further indicating that during the months of full foliage, visual effects would be minimal or nonexistent. The Viewshed Analysis report is included in Appendix F and results are on Figure 4-3.

Because of the limited disturbance associated with the installation of the utility lines beneath the Parkway and the fact that those disturbed areas would be restored to their original condition after the installation is complete, there would be only short-term negligible adverse impacts to the Baltimore Washington Parkway Historic District, no adverse effect under Section 106. The State Historic Preservation Officer concurred that the actions proposed under this alternative would have no adverse effect to any historic resources. The Section 106 concurrence letter can be found in Appendix G. Over the long-term, however, there would be beneficial impacts as the buffers would be maintained and would help protect scenic quality and historic significance of the Parkway

Cumulative Impacts. Widening and/or improving MD 198 would extend across the Parkway. While final plans are not known, it is understood that the state of Maryland would have to comply with Section 106 and any additional terms imposed by the NPS regarding use of parkland for transportation projects. It can be assumed that the MD 198 project would directly impact the Parkway because they intersect, but the impacts may be long-term and minor, depending on the final scope of work and the length of the

construction schedule. Fort Meade, as a federal installation, is also obligated to follow the federal environmental review process and mitigate any potential impacts to historic resources. All construction and land use for the BRAC expansion would be conducted in accordance with NEPA and Section 106 regulations, protecting the cultural resources in the area. The BRAC expansion, due to its distance from the Parkway, would not directly impact the Parkway as a historic resource. These impacts in combination with the potential impacts of the Alternative 2 would result in long-term negligible to minor adverse cumulative impacts.

Conclusion. The action alternative brings with it protection to the contributing scenic features of the Baltimore Washington Parkway Historic District, creating long-term beneficial impacts. Short-term negligible adverse impacts would occur from the installation of the utilities line beneath the Parkway, no adverse effect under Section 106. There would also be long-term minor adverse cumulative impacts associated with the widening of MD 198 and activities associated with the Fort Meade BRAC expansion. However, there would be no impairment of any resource.

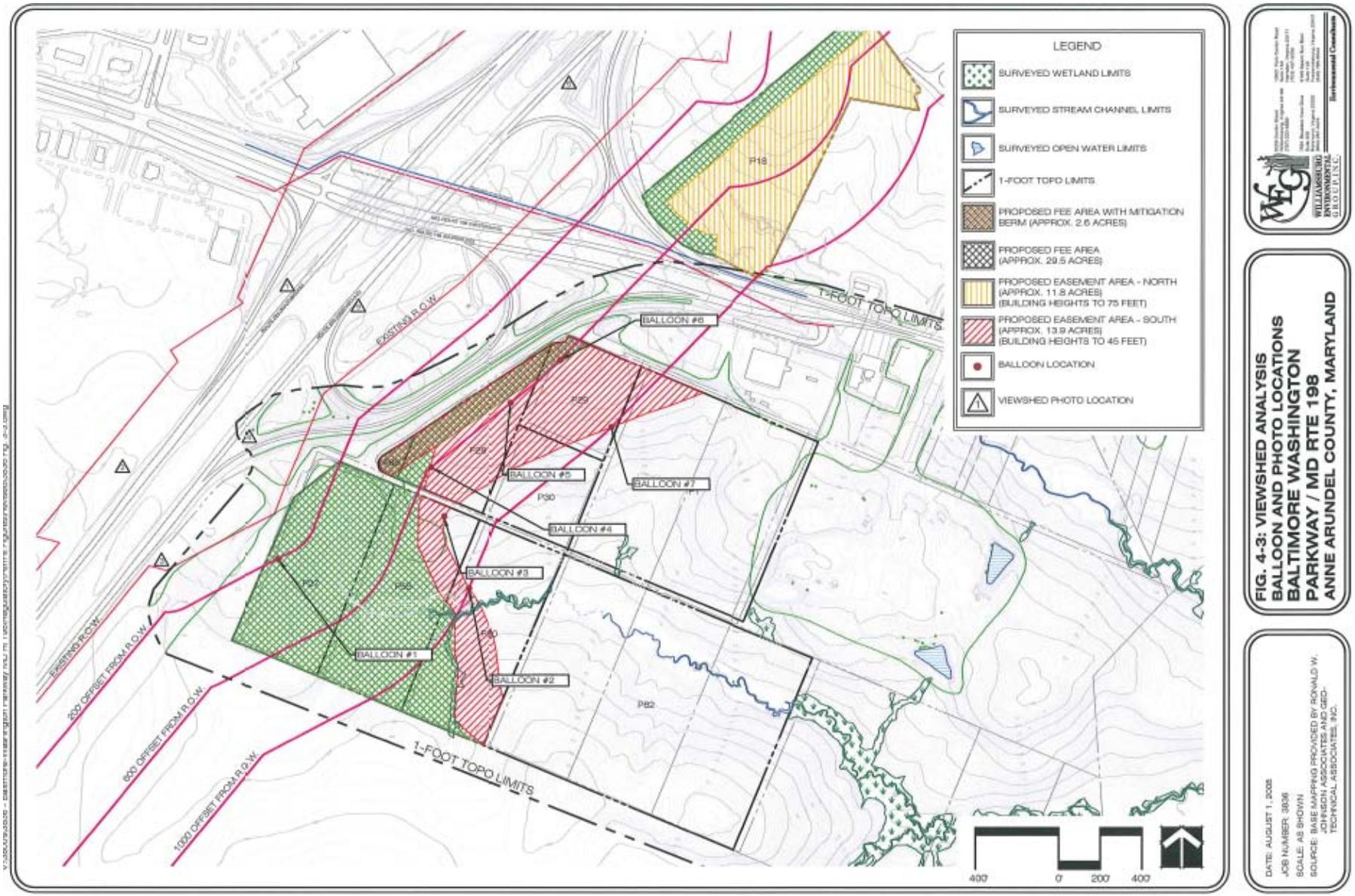

Figure 4-3 Viewshed Analysis Balloon and Photo Locations

4.7 Vegetation

Methodologies and Assumption

Comprehensive information on vegetation and vegetative communities occurring within the project was compiled and reviewed. Assessments of potential short- and long-term project impacts on vegetation were based on general characteristics of each proposed alternative affecting vegetated areas associated with the alternatives.

Study Area

The geographic study area within which impacts to vegetation was evaluated included portions of the Parkway and Refuge and the parcels immediately adjacent.

Impact Threshold

The following thresholds were used to determine the magnitude of impacts on vegetation:

Negligible – No native vegetation would be affected or some individual native plants could be affected because of the alternative, but there would be no effect on native species populations. The effects would be on a small scale and no species of special concern would be affected.

Minor – The alternative would affect some individual native plants and would affect a relatively minor portion of that species' population. Mitigation to offset adverse effects, including special measures to avoid affecting species of special concern, could be required and would be effective.

Moderate – The alternative would affect some individual native plants and would affect a sizeable segment of the species' population and over a relatively large area. Mitigation to offset adverse effects could be extensive, but would likely be successful. Some species of special concern could also be affected.

Major – The alternative would have a considerable effect on native plant populations, including species of special concern, and affect a relatively large area within and outside of the study area. Mitigation measures to offset the adverse effects would be required, extensive, and success of the mitigation measures would not be guaranteed.

Duration – Short-term impacts would last less than a year, long-term impacts would occur longer than one year.

Impacts of Alternative 1 – No Build Alternative

Analysis. Under the no action alternative, adverse impacts to vegetation could occur from the installation of the water main to the connection at MD 198 and MD 32. Indirect impacts are expected from the industrial park development proposed to be constructed in the study area, as constructing the project would involve the clearing of vegetation. The industrial park development could result in the paving of up to the maximum lot coverage of 75 percent of the entire site for zoning districts classified as W1 (Industrial Park District). Although a minimum amount of forest cover would be required by the Forest Conservation Act, the remaining forest could be located anywhere on the site. Forested areas could be cleared up to the boundary of the Refuge and to the ROW of the Parkway.

Likewise, adverse impacts to vegetation are expected for the installation of the water and sewer lines to Piney Orchard WWTP. Indirect impacts are expected from mixed-use development proposed to be constructed on the Arundel Gateway property, as constructing the project would involve the clearing of vegetation. The potential area for vegetation loss in the mixed-use development with access to the Piney Orchard WWTP would be based on a maximum residential density of seven to 22 units per acre for Mixed Use Districts (MXD) and associated commercial densities under existing zoning or MXD. There would be a minimum amount of forest cover required by the Forest Conservation Act. However, forested areas could be cleared up to the boundary of the Refuge and to the ROW of the Parkway.

The forest conservation threshold for the Maryland Forest Conservation Act, as implemented in the Anne Arundel County Code (Bill No. 305, Subtitle 3, Forest Conservation PP 17-6-306) is 15 percent for this alternative. If existing forest cover is cleared and the remaining forest cover is above the threshold, the site shall be reforested at a ratio of one-fourth acre for each acre cleared with each additional acre of the site remaining in forest cover above the threshold counted as a credit against the amount of reforestation required. If existing forest cover is cleared and the remaining forest cover is below the forest conservation threshold, the site shall be reforested at a ratio of two acres planted for each acre cleared below the forest threshold and one-fourth acre planted for each remaining acre of forest cover cleared above the threshold.

Overall, adverse impacts to vegetation under the no action alternative could be long-term and moderate because of the permanent loss of vegetation from a potentially large area from development that could occur within the project area.

Cumulative Impacts. Removal of vegetation and trees associated with the Fort Meade BRAC expansion along with the widening of MD 198, when combined with the potential impacts to vegetation from the no action alternative, would result in long-term moderate adverse cumulative impacts.

Conclusion. The removal of trees and vegetation up to the Parkway and Refuge property lines could have a long-term moderate adverse impact on vegetation. There could also be long-term moderate adverse cumulative impacts. There would be no impairment to vegetation under this alternative.

Impacts of Alternative 2 – Build Alternative

Analysis. During the installation of the water and sewer lines beneath the parkway short-term negligible adverse impact to vegetation would occur as small areas that are comprised mostly of grasses would be disturbed as part of the directional boring operation. After the installation of the new lines is complete, the disturbed area would be rehabilitated and revegetated.

While development within the Arundel Gateway area would occur, as a condition of the proposed mixed-use development connecting to the sewer line under the Parkway, land transfers/buffer areas would be provided for the Parkway and the Refuge, protecting roughly 20-30 acres of protection, in addition to the areas that would be protected under the Forest Conservation Act. The forest conservation threshold as defined in the Maryland Forest Conservation Act, as implemented in the Anne Arundel County Code (Bill No. 305, Subtitle 3. Forest Conservation PP 17-6-306) is 15 percent for this alternative. If existing forest cover is cleared and the remaining forest cover is above the threshold, the site shall be reforested at a ratio of one-fourth acre for each acre cleared with each additional acre of the site remaining in forest cover above the threshold counted as a credit against the amount of reforestation required. If existing forest cover is cleared and the remaining forest cover is below the forest conservation threshold, the site shall be reforested at a ratio of two acres planted for each acre cleared below the forest threshold and one-fourth acre planted for each remaining acre of forest cover cleared above the threshold.

While these required mitigations would result in large tracts of contiguous forested and vegetated areas being protected along the Refuge and Parkway, some development within the project area would still be allowed to occur. The indirect adverse impacts to vegetation associated with this development would be long-term and minor

Cumulative Impacts. Removal of vegetation and trees for associated with the Fort Meade BRAC expansion along with the potential to remove trees in actions associated with the widening of MD 198 when combined with the potential impacts to vegetation from Alternative 2 would result in long-term moderate adverse cumulative impacts to vegetation.

Conclusion. Actions proposed under Alternative 2 would result in short-term negligible adverse impacts to vegetation from the installation of the utilities line beneath the Parkway and long-term minor adverse indirect impacts associated with the development that could occur within the project area. There would also be long-term moderate adverse cumulative impacts to vegetation associated with the widening of MD

198 and activities associated with the Fort Meade BRAC expansion. There would be no impairment to vegetation under this alternative.

4.8 Wildlife and Wildlife Habitat

The Organic Act of 1916, which directs parks to conserve wildlife unimpaired for future generations, is interpreted by the agency to mean that native animal life should be protected and perpetuated as part of the park's natural ecosystem. Natural processes are relied on to control populations of native species to the greatest extent possible; otherwise, they are protected from harvest, harassment or harm by human activities. Management goals for wildlife include maintaining components and processes of naturally evolving park ecosystems, along with the natural abundance, diversity and the ecological integrity of plants and animals. Information on wildlife occurring with in the project area compiled from on-site observations and publications referenced in Section 8.

Study Area

The study area for wildlife includes areas within and adjacent to the Parkway and Refuge.

Impact Threshold

The following thresholds were used to determine the magnitude of potential impacts on wildlife:

Negligible – There would be no observable or measurable impacts to native species, their habitats, or the natural processes sustaining them. Impacts would be well within the natural fluctuations.

Minor – Impacts would be detectable, but they would not be expected to be outside the natural range of variability of native species populations, their habitats or the natural processes sustaining them. Mitigation measures, if needed to offset adverse effects, would be simple and successful.

Moderate – Breeding animals of concern are present, animals are present particularly during vulnerable life-stages, such as migration or juvenile stages; mortality or interference with activities necessary for survival can be expected on an occasional basis, but is not expected to threaten the continued existence of the species in the park unit. Impacts on native species, their habitats or the natural processes sustaining them would be detectable, and they could be outside the natural range of variability. Mitigation measures, if needed to offset adverse effects, would be extensive and likely successful.

*Majo*r – Impacts on native species, their habitats or the natural processes sustaining them would be detectable, and they would be expected to be outside the natural range of variability. Key ecosystems processes might be disrupted. Loss of habitat might affect the viability of at least some native species. Extensive mitigation measures would be needed to offset and adverse effects and there success would not be guaranteed.

Duration – Short-term impacts would last less than one year; long-term impacts would occur longer than one year.

Impacts of Alternative A – No Action Alternative

Analysis. Under the no action alternative, no direct impacts to wildlife or wildlife habitat would occur within the Parkway or Refuge. The Parkway is designed to be a motorway in a park-like setting, and is not intended to serve as quality habitat for wildlife. The Refuge, however, provides abundant and diverse habitat for wildlife.

Under this alternative, development on the Arundel Gateway property would be allowed to occur without NPS restrictions. This could result in a certain loss of wildlife habitat up to the property lines of both the Parkway and the Refuge. Indirect adverse impacts from the no action alternative would result from any future development to occur within the project area. Development under this alternative would include

on-site sewage disposal under the existing W-1 or C-4 zoning, or construction of utility lines to the east of the project window towards the Piney Orchard facility. The zoning regulations for the proposed site plan require only 30-foot building setbacks from the edge of the property bordering the Refuge including a 10-foot landscape buffer. The clearing of forest for development would result in loss of habitat for wildlife up to the Refuges edge. While the Refuge would not be directly impacted, the construction of buildings within 30 feet of the Refuge would result in long-term moderate adverse indirect impacts to wildlife habitat within the Refuge from increased noise and attendant human activity and from the fragmentation of forest habitats.

No federally listed threatened or endangered species live within the project area, therefore no impacts will occur to federally protected species. Of the four state listed species found in the refuge, the glass darter (*Etheostoma vitreum*) and the American brook lamprey (*Lampetra appendix*) would be most likely to be indirectly affected by degradation of the water quality within the watershed by development within the project area. While the state would require all developers to treat stormwater runoff, minor adverse impacts to water quality could still occur. This could result in long-term minor adverse impacts to the aquatic habitats of the glass darter and the American brook lamprey, as well as the other aquatic organisms that inhabit the watershed.

Cumulative Impacts. The widening of MD 198 and construction activities associated with the Fort Meade BRAC expansion would all result in the loss of habitat within the general area. The MD 198, if widened to the south side of the road, would remove some habitat from the edge of the Parkway and Refuge. This would create a long-term, minor adverse impact due to the small amount of habitat loss, located in the highway corridor, in relation to the overall size of the Refuge and Parkway. The Fort Meade construction is not directly adjacent to the Parkway or Refuge and the loss of habitat there is expected to have negligible impacts on these resources. Cumulatively, this may create a moderate, long-term adverse impact on the habitat in the Parkway and Refuge.

Conclusion. Due to unmitigated habitat loss adjacent to the Refuge, the no action alternative presents a long-term, moderate adverse impact on the wildlife and habitat in the Refuge. No RTE species are present in the project area. Development in the area could result in impacts to water quality, which could result in long-term minor adverse affect the state threatened glassy darter found downstream of the development. There could also be long-term moderate adverse cumulative impacts. There would be no impairment to wildlife and wildlife habitat under this alternative.

Alternative 2 – Action Alternative

Analysis. Direct impacts from the action alternative would be limited to disturbance under the Parkway rights-of-way and is expected to have a negligible impact upon wildlife. In addition, the utility line placement along MD 198 would have a negligible indirect impact since the construction in proximity to a major roadway disturbs little habitat. As with the no action alternative, indirect impacts are expected to result from development proposed within the study area. The proposed development at Arundel Gateway would result in the clearing of much of the forest, but would be mitigated by requirements placed upon developers seeking to utilize the utility services provided under this alternative. NPS would require any prospective development to include forested buffers between the project and the Refuge property, to reduce fragmentation and help reduce impacts upon the Refuge from a nearby development. In addition, forest conservation areas would be planted as close to the Refuge as possible. While the action alternative provides habitat protection along the Parkway and Refuge boundaries, there would be long-term negligible to minor adverse indirect impacts to wildlife and wildlife habitat within the project area from the development that could occur. In addition, there would also be long-term minor adverse cumulative impacts. These impacts would be mitigated by working to maintain

continuity of conserved forest adjacent to the Refuge forest and reducing any impacts from development upon the remaining wildlife habitat.

In the area where the new utility lines would be installed and areas within the buffer where no development would occur, no direct impacts to any state listed threatened and endangered species are would occur.

No federally listed threatened or endangered species live within the project area, therefore no impacts will occur. Of the four state listed species found in the refuge, the glass darter and the American brook lamprey would be most likely to be indirectly affected by degradation of the water quality within the watershed by development within the project area. These long-term adverse impacts however would be negligible to minor as a of the NPS requirements to minimize impacts to water quality, which would include:

- Establishing forested buffers;
- Enacting strict stormwater management requirements for the development beyond those of the state and local regulations;
- Requiring robust erosion and sediment control plans; and
- Establishing a water quality monitoring program

The proposed development would also provide all of the recommended protections to minimize impacts from development in the vicinity of rare fish species that are listed by MDNR

Cumulative Analysis. The widening of MD 198, and construction activities at Fort Meade all result in the loss of habitat in the general area. The MD 198, if widened to the south side of the road, would remove some habitat from the edge of the Refuge. This would create a long-term, minor adverse impact due to the small amount of habitat loss, located in the highway corridor, in relation to the overall size of the Refuge. The Fort Meade construction is not directly adjacent to the Parkway or Refuge and the loss of habitat there is expected to have negligible impacts on these wildlife and wildlife habitat resources. These impacts in combination with the impacts associated with Alternative 2 would result in long-term minor adverse cumulative impacts.

Conclusion. While the action alternative provides habitat protection along the Parkway and Refuge boundaries, there would be long-term negligible to minor adverse indirect impacts to wildlife and wildlife habitat within the project area from the development that could occur. In addition, there would also be long-term minor adverse cumulative impacts. There would be no impairment to wildlife and wildlife habitat under this alternative.

[This page intentionally left blank.]

5.0 CONSULTATION AND COORDINATION

5.1 Agency Coordination and Comments

During the scoping phase of the project, NPS sought to receive feedback from applicable federal, state, and local agencies on the proposed action. On January 8, 2008, an agency scoping meeting was held at the Maryland City Volunteer Fire Station in Laurel, MD. The meeting was attended by representatives from the U.S. Fish and Wildlife Agency, Fort Meade, Maryland State Highway Administration, Maryland Department of Transportation, Anne Arundel County Public Works, Anne Arundel County Office of Planning and Zoning, Anne Arundel County Council and representatives from the offices of U.S. Congressman Steny Hoyer and the Lieutenant Governor.

The meeting provided an opportunity to present the proposed action and respond to questions or concerns from the agencies in attendance. During the meeting, it was established that the proposed action would fulfill the long-term plans of the County DPW for water line redundancy in the region and many questions were raised and addressed regarding the scope of the EA and impacts from future development in the area.

Following the meeting, two formal letters from USFWS were received by NPS regarding the proposed action (Appendix J). The first letter, dated February 6, 2008, identified USFWS' concerns for impacts upon the Patuxent Research Refuge resulting from the project. The second letter, dated March 18, 2008, proposed four possible actions or commitments that could be undertaken along with the proposed action to mitigate or avoid impacts upon the Refuge that may occur as a result of the proposed action. These proposals included:

- Fencing along the refuge boundary to minimize trespass/disturbance issues. Ideally, this would include an "escrow account", with a non-refuge entity, such as our Friends Association, to allow for future maintenance of the fence and/or wall.
- Possible land transfers and/or exchanges to the Service and/or land trusts of critical parcels owned by the developer, to address boundary management issues, and to preserve additional habitat and create additional buffers. One example of this would be a small portion of the property located approximately 250 yards east of Bald Eagle Drive that, if transferred to the Service, would grant the refuge full control along one of the Refuge access roads.
- Appropriately designed stormwater management features to limit runoff to current conditions, and improvements to Bald Eagle Drive and the culvert by the North Tract's entrance gate to minimize flood potential.
- A covenant that there would be no manmade structures, walking path, etc. with a specified distance from the refuge boundary to provide an appropriate buffer from refuge activities, including hunting.

The letter also requested water quality monitoring and any reforestation efforts to be located near the Refuge if possible.

5.2 Public Involvement and Notification

The National Park Service recognizes the importance of public involvement in evaluating the proposed action and has taken steps during the evaluation process to provide opportunities for the public to comment. In the early stages of the project, NPS held a Public Scoping Meeting on February 6, 2008 at the Maryland City Volunteer Fire Station in Laurel, MD. The purpose of the meeting was to present the available details of the proposed action, including the proposed development for the MD 198 corridor, and to solicit input from the public regarding the scope of the EA. The meeting was attended by representatives from NPS, Anne Arundel County Public Works, Arundel Gateway Development, USFWS and at least 35 people from the general public who signed in. During the meeting, eight people requested

to make statements related to the proposed project. Many more attendees asked questions and commented more informally during a question and answer session. After the meeting, a 30-day comment period was allowed for the public to submit comments via mail, phone, and e-mail. During the meeting, attendees were able to sign up to be part of a distribution list for project updates and project materials were made available on the NPS PEPC website.

At the end of the comment period, NPS had received 33 comments, although in a couple cases they were multiple submissions from one person or group. As with the remarks received during the public meeting, these comments received by letter, phone, and e-mail included statements of support as well as statements of concern and opposition. The comments raising concerns and opposition to the project typically focused on a number of similar issues, mostly because of the possibility of increased development. The issues raised most often included:

- Impacting the use of the Patuxent Research Refuge for hunting;
- Water quality impacts from stormwater runoff;
- Forest fragmentation and loss of forest habitat.

Comments in support of the project generally cited the opportunity to develop the area while providing protections for the Patuxent Research Refuge through NPS as the main reason for speaking favorably on the topic. All comments received were considered in this EA.

Section 106 Coordination

The Maryland Historic Trust has been sent a copy of the Phase I cultural resource study along with a request for the review of the project under Section 106. A concurrence letter can be found in Appendix G stating that no historic properties will be affected by the action alternative.

6.0 PREPARER LIST

Ellen Brady, Cultural Resources, Inc.

Loretta Cummings, Williamsburg Environmental Group

Mark Dennis, Williamsburg Environmental Group

Corey Gray, Williamsburg Environmental Group

Paul Oldt, Williamsburg Environmental Group

Matt Senska, Williamsburg Environmental Group

Eileen Watson, Williamsburg Environmental Group

Kim Zawacki, Cultural Resources, Inc.

[This page intentionally left blank.]

7.0 REVIEWER LIST

Joseph A. Cook, Chief, Land Resources, National Capital Region, National Park Service

James Rosenstock, Park Ranger, Baltimore Washington Parkway, National Capital Parks – East, National Park Service

Brad Knudsen, Refuge Manager, Patuxent Research Refuge, U.S. Fish & Wildlife Service

Holliday H. Obrecht, III, Wildlife Biologist, Region 5, Patuxent Research Refuge, U.S. Fish & Wildlife Service

Joel Gorder, Regional Environmental Coordinator and Lands Liaison, National Capital Region, National Park Service

[This page intentionally left blank.]

8.0 REFERENCES

Advisory Council on Historic Preservation. 1966. The National Historic Preservation Act of 1966 Public Law 89-665; 16 USC 470 et seq.

Advisory Council on Historic Preservation. 1999. ACHP Guidelines for Implementing Section 106.

Andreason, David C. 2007. *Optimization of Ground-Water Withdrawals In Anne Arundel County, Maryland, From The Upper Patapsco, Lower Patapsco, and Patuxent Aquifers Projected Through 2044*. Retrieved February 6, 2008. http://www.mgs.md.gov/esic/publications/download/RI77abst.pdf

Anne Arundel County, Maryland; http://www.aacounty.org/

Anne Arundel County, Maryland. 2007. Master Plan for Water Supply and Sewerage Systems, 2007-2010.

Anne Arundel County, Maryland. 2003. Comprehensive Water Strategic Plan.

Anne Arundel County, Maryland. 2005. Anne Arundel County Code, Article 18: Zoning.

Anne Arundel County, Maryland. 2004. Jessup/Maryland City Small Area Plan. Retrieved February 6, 2008. http://www.aacounty.org/planzone/sap/resources/jessupintro.pdf

Anne Arundel Economic Development Corporation (AAEDC). 2007. Economic Indicators: 3rd Quarter 2007. Retrieved February 22, 2008. http://www.aaedc.org/images/stories/pdf/economicindicators3rdqtr2007.pdf

Annotated Code of Maryland. Environment Article, Title 4, Subtitle 1; the Code of Maryland Regulations (COMAR) 26.17.01.

Cline, K. 1985. Bald Eagles in the Chesapeake: A management guide for landowners. National Wildlife Federation.

Colorado Department of Transportation. 2005. *Noise FAQ*. Retrieved February 22, 2008. http://www.dot.state.co.us/environmental/culturalresources/noise/noisefaqsupdatednov05.pdf

Council on Environmental Quality. 40 CFR 1500-1508.

Council on Environmental Quality. *NEPA's Forty Most Asked Questions*.

Cowardin, Lewis M. et al. 1979. Classification of Wetlands and Deepwater Habitats of the United States. U.S. Department of the Interior, Fish and Wildlife Services, Washington, D.C.

Environmental Laboratory. 1987. *Corps of Engineers Wetlands Delineation Manual.* Technical Report No. 87-Y-1.

Executive Order 12898. 1994. Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations.

Final Environmental Impact Statement for Implementation of Base Realignment and Closure and Enhanced Use Lease Actions at Fort George G. Meade, Maryland. 2007. Fort Meade Directorate of Public Works. Fort Meade, Maryland.

Federal Emergency Management Agency. 1983. Flood Insurance Rate Maps, Community Panel

Numbers 2400080016C, 2400080017C, 2400080018C, 2400080024C, 2400080025C.

Fort Meade. 2009. http://www.ftmeade.army.mil/pages/history/history.html

Hotchkiss, N. & Stewart R.E. 1947. Vegetation and Vertebrates of the Patuxent Wildlife

Research Center: Outline of Ecology and Annotated Lists.

Jaffee, N. B. 1980. Nest site selection and foraging behavior of the bald eagle (*Haliaeetus leucocephalus*) in Virginia. Department of Biology, College of William and Mary, Williamsburg, Virginia. Master's Thesis.

Jessup/Maryland City Small Planning Area;
http://www.aacounty.org/PlanZone/SAP/Resources/JessupMap04.pdf

Maryland Department of the Environment. 1994. Maryland Standards & Specifications for Soil Erosion & Sediment Control.

Maryland Department of Natural Resources. http://www.dnr.state.md.us/wildlife/espaa.asp. 1995-2004. Maryland Endangered Species Natural Heritage Program.

Maryland Department of Natural Resources. 2008. Final 2008 Integrated Report of Surface Water Quality in Maryland

Maryland Department of Natural Resources. 2009. Maryland's Rivers and Streams.
http://www.dnr.state.md.us/streams/101/definitions.html

Maryland Department of Planning. Maryland Historical Trust.

http://www.marylandhistoricaltrust.net/. 1995-2008.

Maryland State Highway Administration (MDSHA). 2007. MD-198 Project Planning Study.

Project Newsletter – Fall 2007.

National Environmental Policy Act. 42 U.S.C.4321 et seq., 1969, as amended.

Native American Graves Protection and Repatriation Act (NAGPRA), 1990. Pub.L. 101-601, 104 Stat. 3048.

Natural Heritage Resources Fact Sheet: Sensitive Joint-Vetch (*Aeschynomene virginica*). 1997.

Richmond, Virginia: Department of Conservation and Recreation, Virginia.

Natural Resource Conservation Service. Retrieved January 2009.
http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx

United States Census Bureau. 2000. Fact Sheet: Anne Arundel County, Maryland. Retrieved

August 26, 2008. http://factfinder.census.gov

United States Census Bureau. 2000. Fact Sheet: Maryland City CDP, Maryland. Retrieved

August 26, 2008. http://factfinder.census.gov

United States Department of the Interior, U.S. Fish and Wildlife Service Chesapeake Bay Field

Office, On-line Certification. May 18, 2009.

http://www.fws.gov/chesapeakebay/EndSppWeb/ELEMENTS/onlineletter.html

U.S. Department of the Interior, Fish and Wildlife Service. Retrieved 2009. Patuxent Research Refuge. http://www.fws.gov/northeast/patuxent/index.htm

U.S. Department of the Interior, National Park Service. 2006. *Management Policies 2006.* Superintendent of Documents, U.S. Government Printing Office

U.S. Department of the Interior, National Park Service. 2001. Director's Order #12 and Handbook; Conservation Planning, Environmental Impact Analysis and Decision Making.

U.S. Department of the Interior, Fish and Wildlife Service. 1988. Endangered and Threatened

Wildlife and Plants; Determination of *Helonias bullata* (Swamp Pink) to be a Threatened Species.

Federal Register Vol. 53 No. 175.

U.S. Department of the Interior, National Park Service. 1916. The National Park Service Organic Act (16 U.S.C. l, 2, 3, and 4).

United States Department of Transportation (USDOT) Federal Highway Administration. N.d. M*easurement of Highway-Related Noise*. Retrieved February 22, 2008.

http://www.fwha.dot.gov/environment/noise/measure/chap9.htm

United States Environmental Protection Agency (EPA). 2007. Greenbook: Non-Attainment Status for Each County by Year Including Previous 1-Hour Ozone Counties. Updated December 20, 2007.Accessed February 6, 2008. http://www.epa.gov/oar/oaqps/greenbk/anayo.html

United States Environmental Protection Agency (EPA). 1990. Clean Air Act Amendments of 1990 U.S.C Title 42, Chapter 85.

United States Geological Survey (USGS). 1979. 7.5 minute series topographic quadrangle map.

Laurel, Maryland.

United States Geological Survey (USGS). 1979. 7.5 minute series topographic quadrangle map.

Odenton, Maryland.

Stevens, C. W. 1991. Swamp Pink, *Helonias bullata* (L.). In *Virginia's Endangered Species*, K.

Terwilliger, ed. McDonald and Woodward, Blacksburg, Virginia. pgs. 88-89.

Web Soil Survey. http://websoilsurvey.nrcs.usda.gov/app/. 2007. United States Department of

Agriculture Natural Resource Conservation Service.